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Laboratory Data Usability

Historic Analytical Data

Historical data for this site was obtained and evaluated for usability. Two criteria were used for judging usability. First, laboratory reports (if available) were evaluated. Data supported by laboratory quality control data were considered usable and of known quality unless the review of the data revealed a reason to reject the data due to quality control issues. Second, data was considered usable if no laboratory quality control data was available, but the data had been reported previously to and reviewed by USEPA.

RI Analytical Data

All analytical data collected to date has been validated following the process outlined in the QAPP. The review of the analytical data was performed in accordance with USEPA National Functional Guidelines and SW846 methodology. Twenty-six soil sample delivery groups and fifty-two water sample delivery groups were evaluated.

Soil samples were analyzed for the following: VOCs by EPA SW846 Method 8260B, SVOCs by SW846 Method 8270C, Pesticides by SW846 Method 8081B, PCBs by SW846 Method 8082, metals by SW846 Method 6010B, hexavalent chromium by SW846 Method 7196, mercury by SW846 Method 7471, ammonia by EPA Method 350.2, total organic carbon by SW846 Method 9060, and cyanide by SW846 Method 9012.

Water samples were analyzed for the following: VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, Pesticides by SW846 Method 8081B, PCBs by SW846 Method 8082, metals by SW846 Method 6020, ammonia by USEPA Method 350.2, inorganic arsenic speciation (Arsenic III and V) by SW846 Method 7063, organic arsenic speciation (DMA and MMA) by SW846 Method 6800, and total kjeldahl nitrogen by EPA Method 351.2..

Quality control criteria that were evaluated for all samples include the following as appropriate for each analytical method: laboratory blanks, field blanks, field duplicates, laboratory duplicates, laboratory control samples, matrix spikes and matrix spike duplicates (MS/MSDs), initial and continuing calibrations, instrument tuning, internal standards, surrogates, confirmation, degradation, holding times, and sample preservation.

An overall evaluation of the data indicates that the sample handling, shipment, and analytical procedures have been adequately completed, and that the analytical results should be considered accurate. The analytical data had minor quality control concerns; however, it did not affect data usability for those specific results. The validation review demonstrated that the analytical systems were generally in control and the data results can be used in the decision making process. Data management procedures included the phases described below.

- Loading verified EDD into the project database
- Resolving any data loading issues
- Creating a post load report for content review
- Notifying the project chemist when EDDs are available in EIM for validation

Data Verification and Validation

The data verification/validation phase includes the following:

- Verifying and validating data according to project specifications and QAPP
- Inserting appropriate data qualification flags and final results into the database as required by the validation level
- Rejecting or excluding those results that are redundant or unusable duplicates
- Generating a data verification/validation report
- Submitting the report to the project database manager, field team leader, and project files

Data Visualization and Analysis

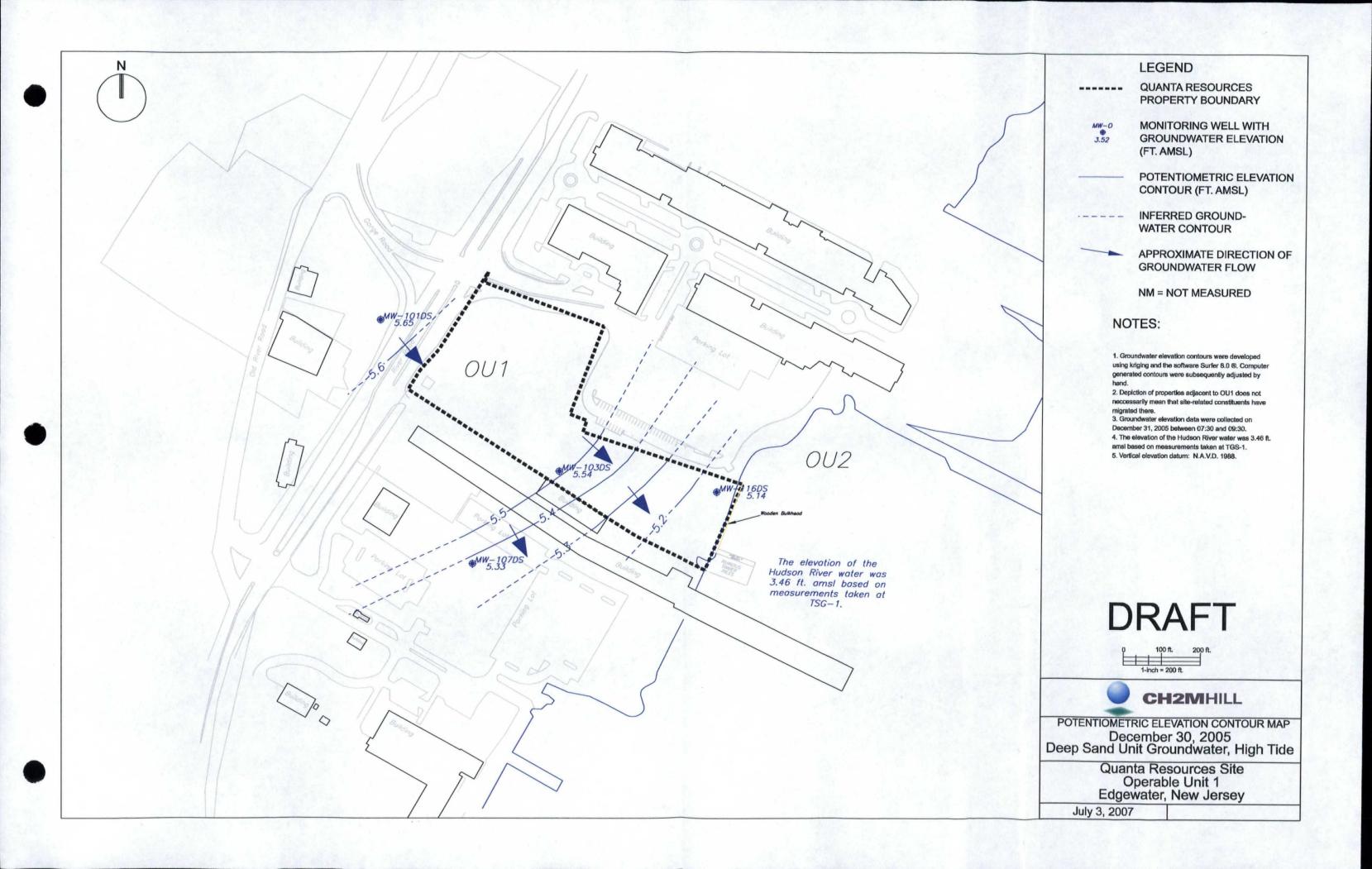
The data visualization and analysis phase includes the initial data review by the project team and the production of data queries and draft reports to dissect and digest the data. This phase was accomplished through the use of query tools and preformatted reports in EIM.

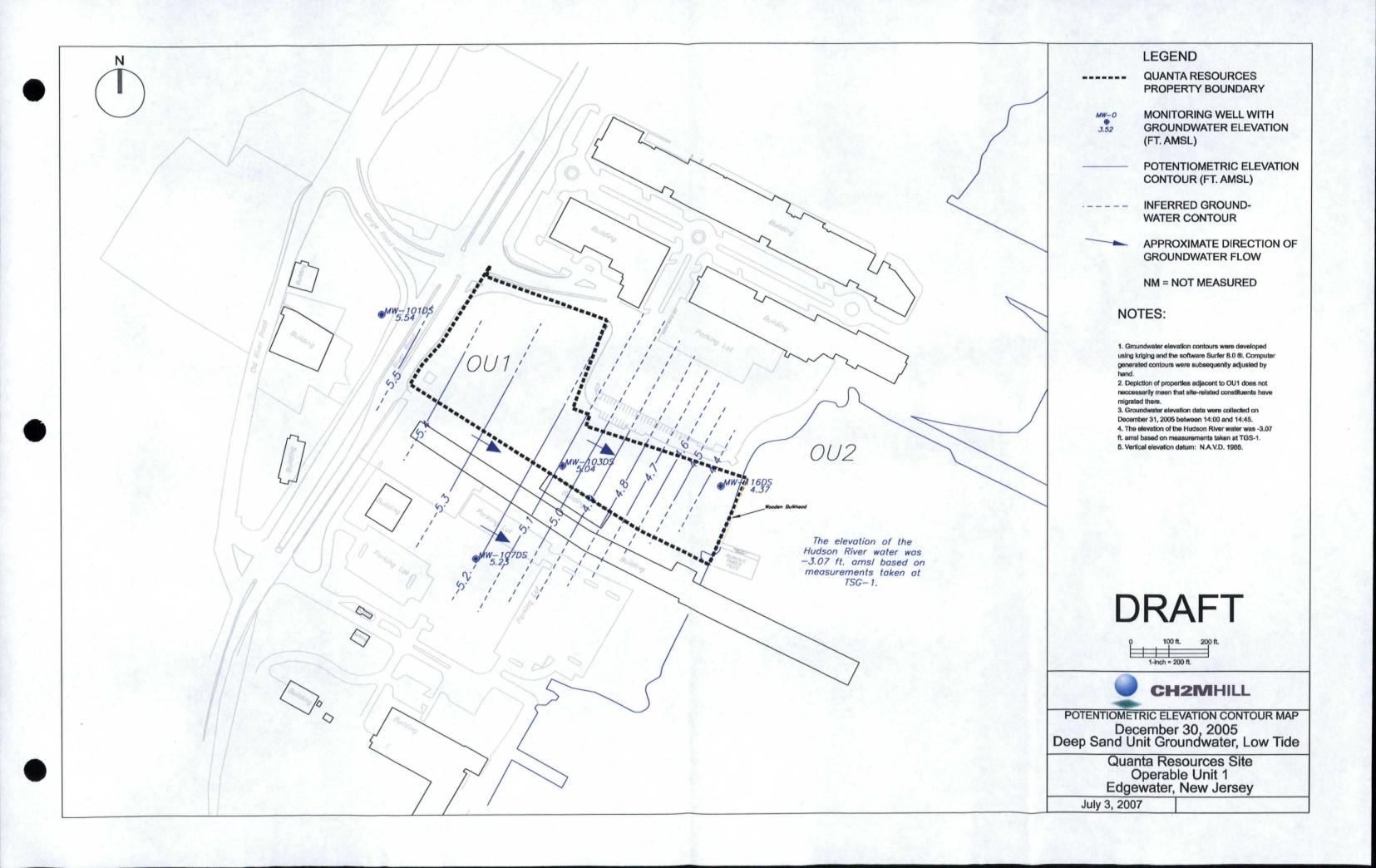
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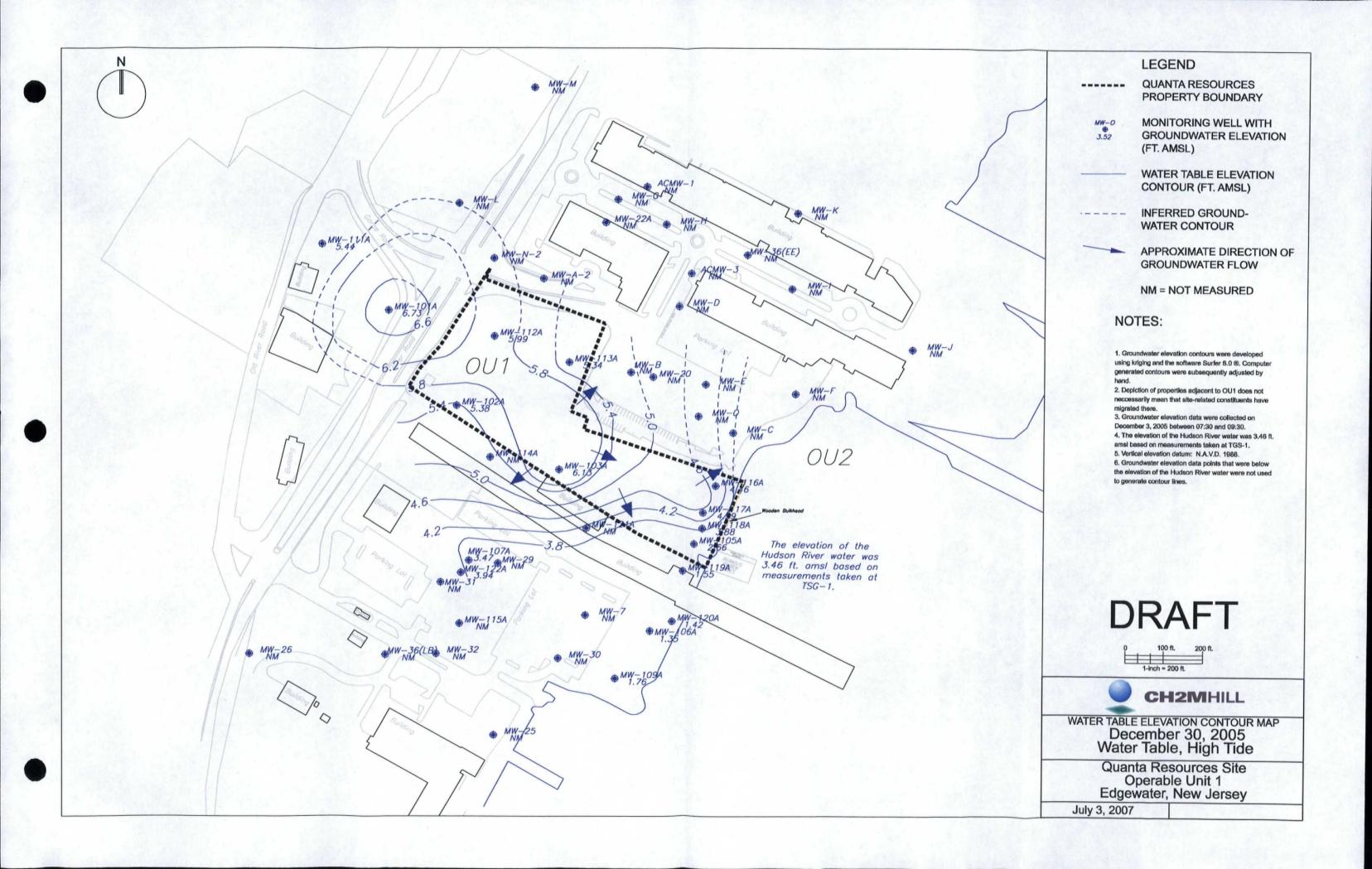
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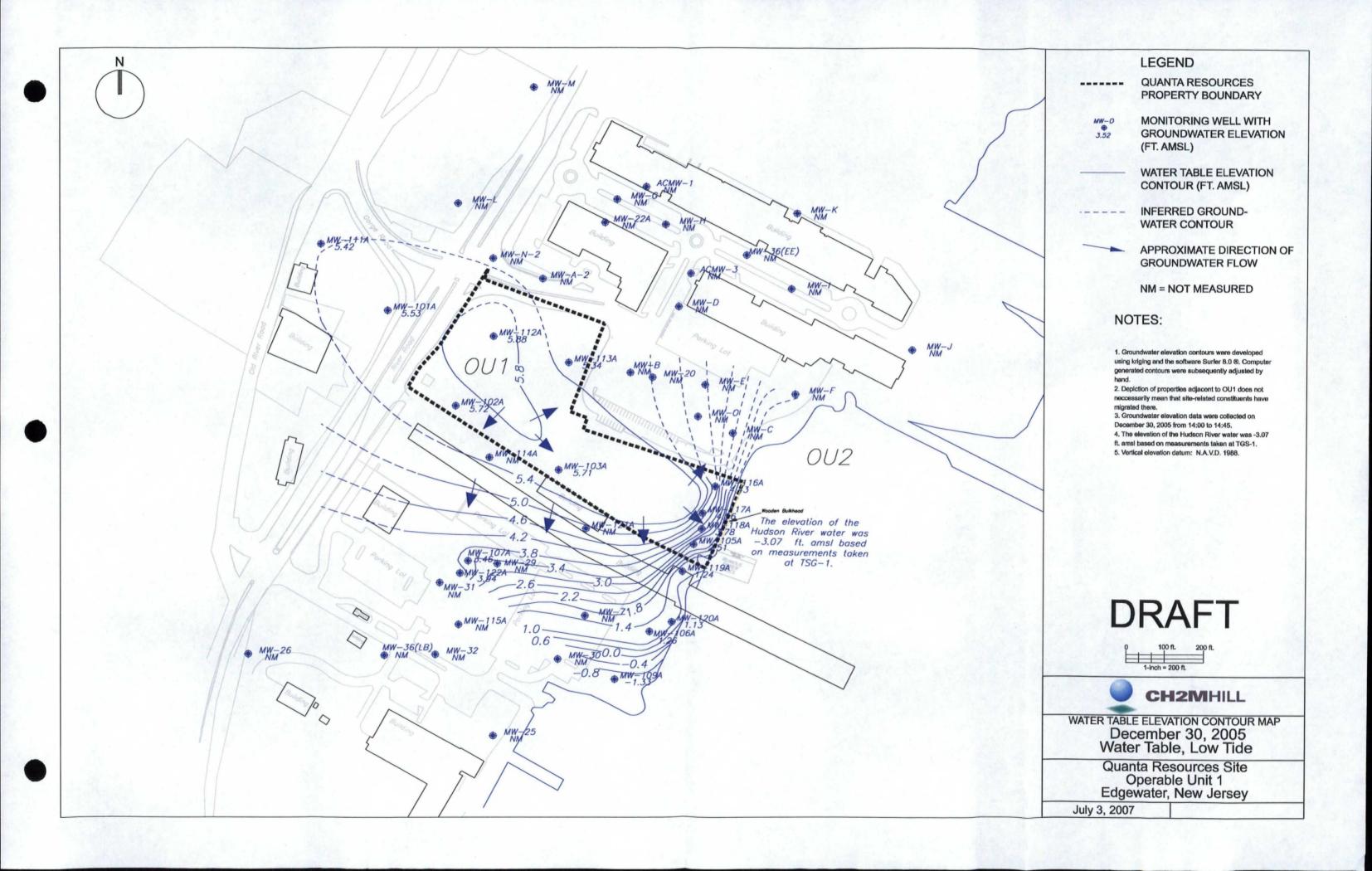
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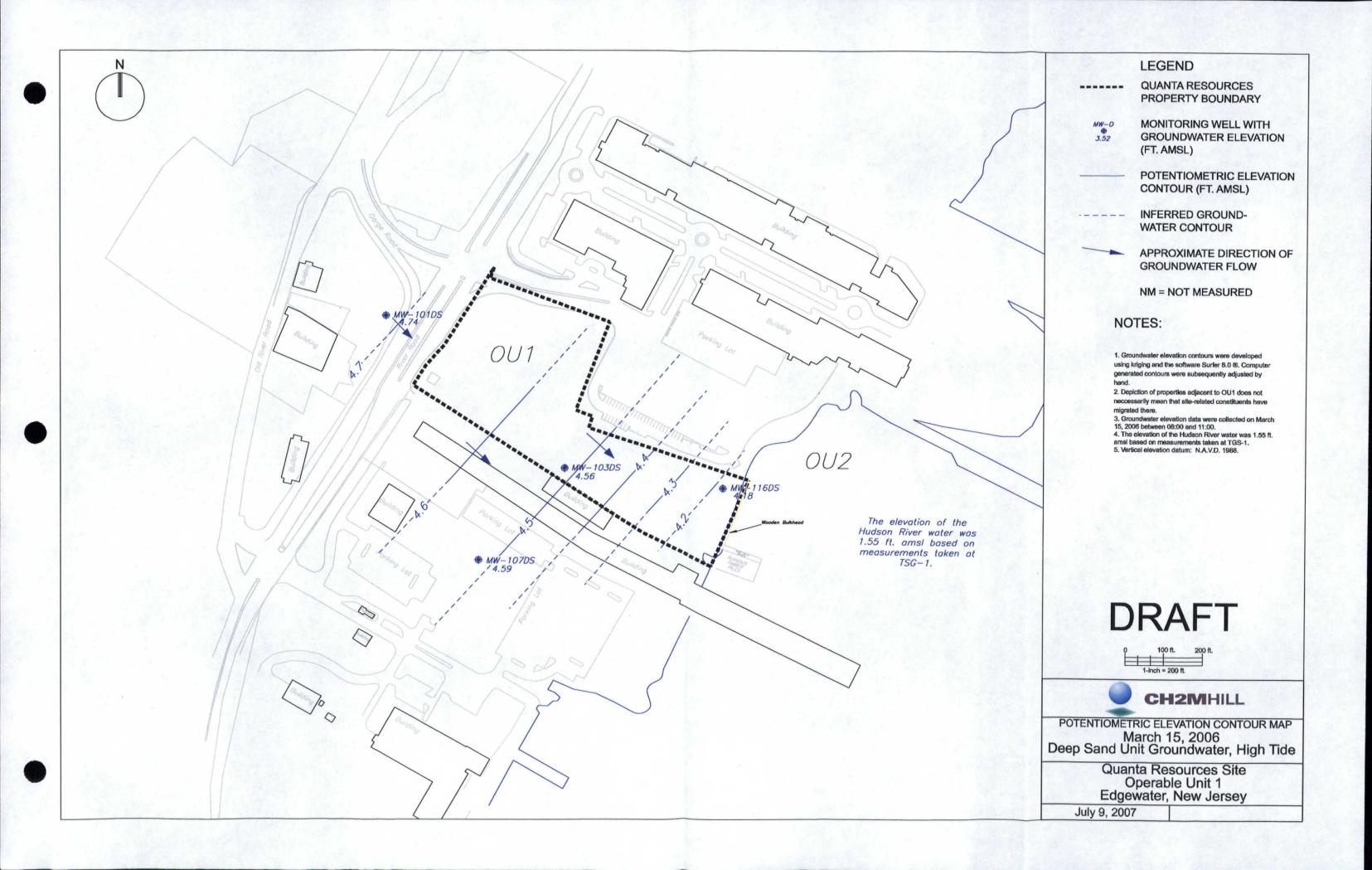
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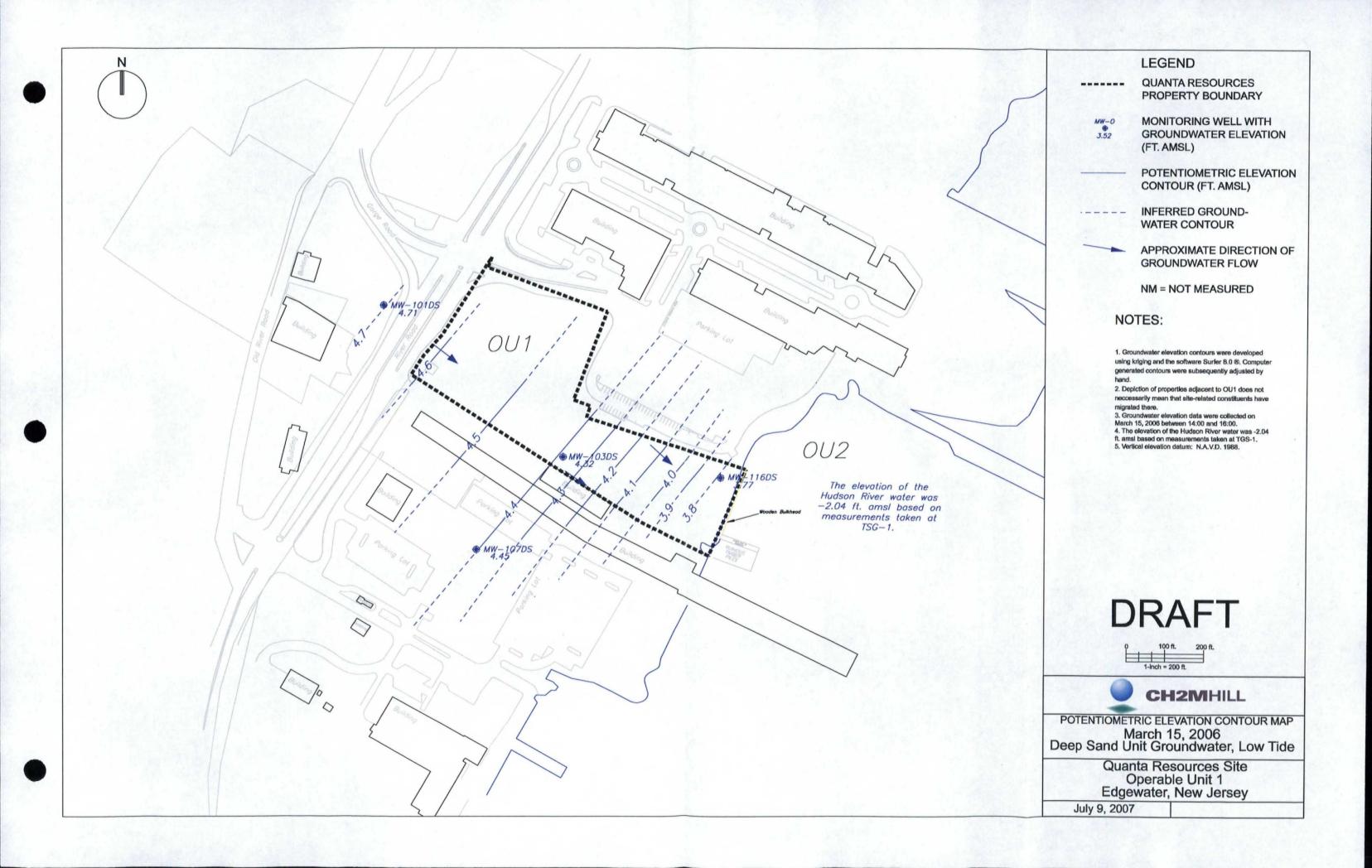


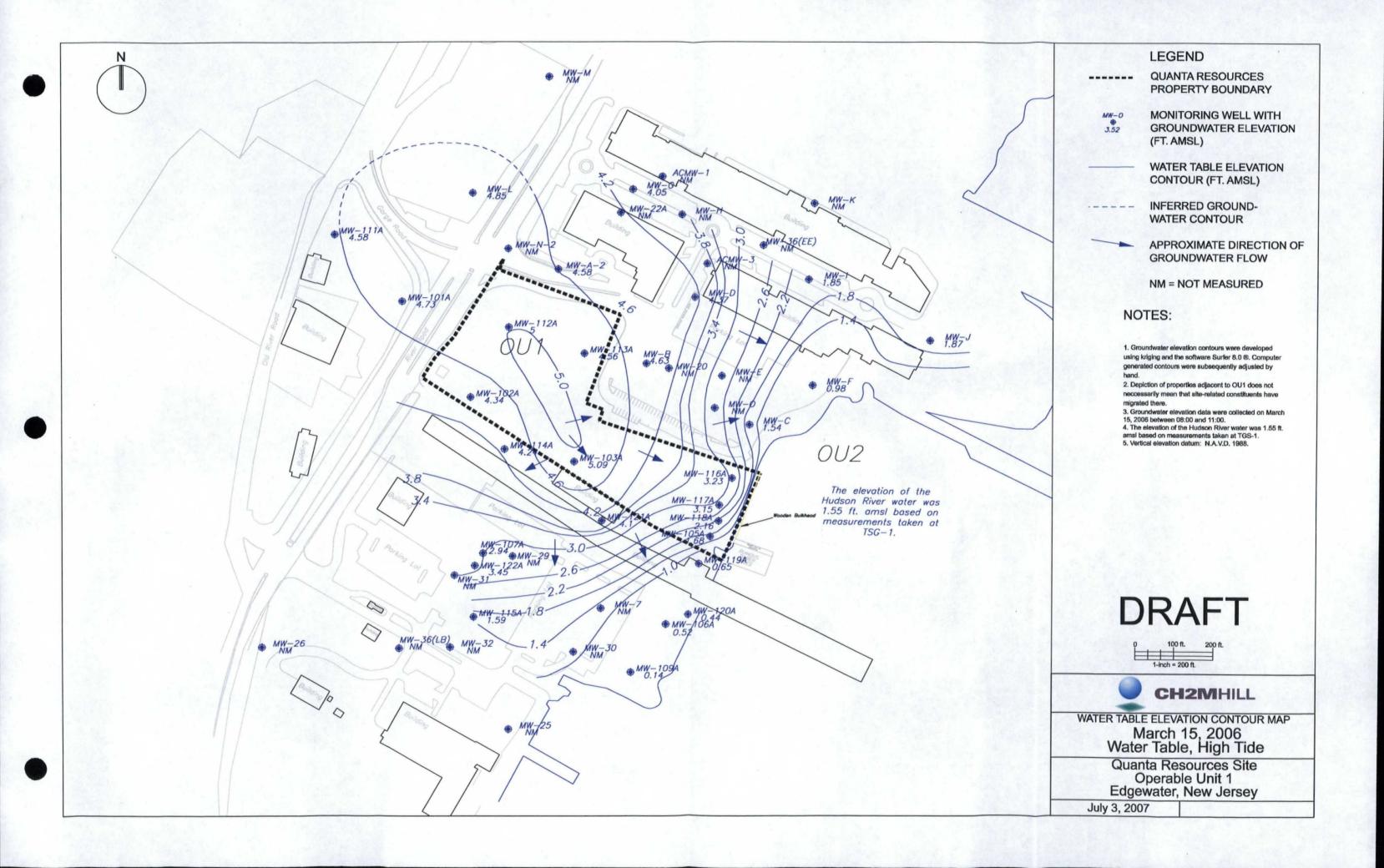


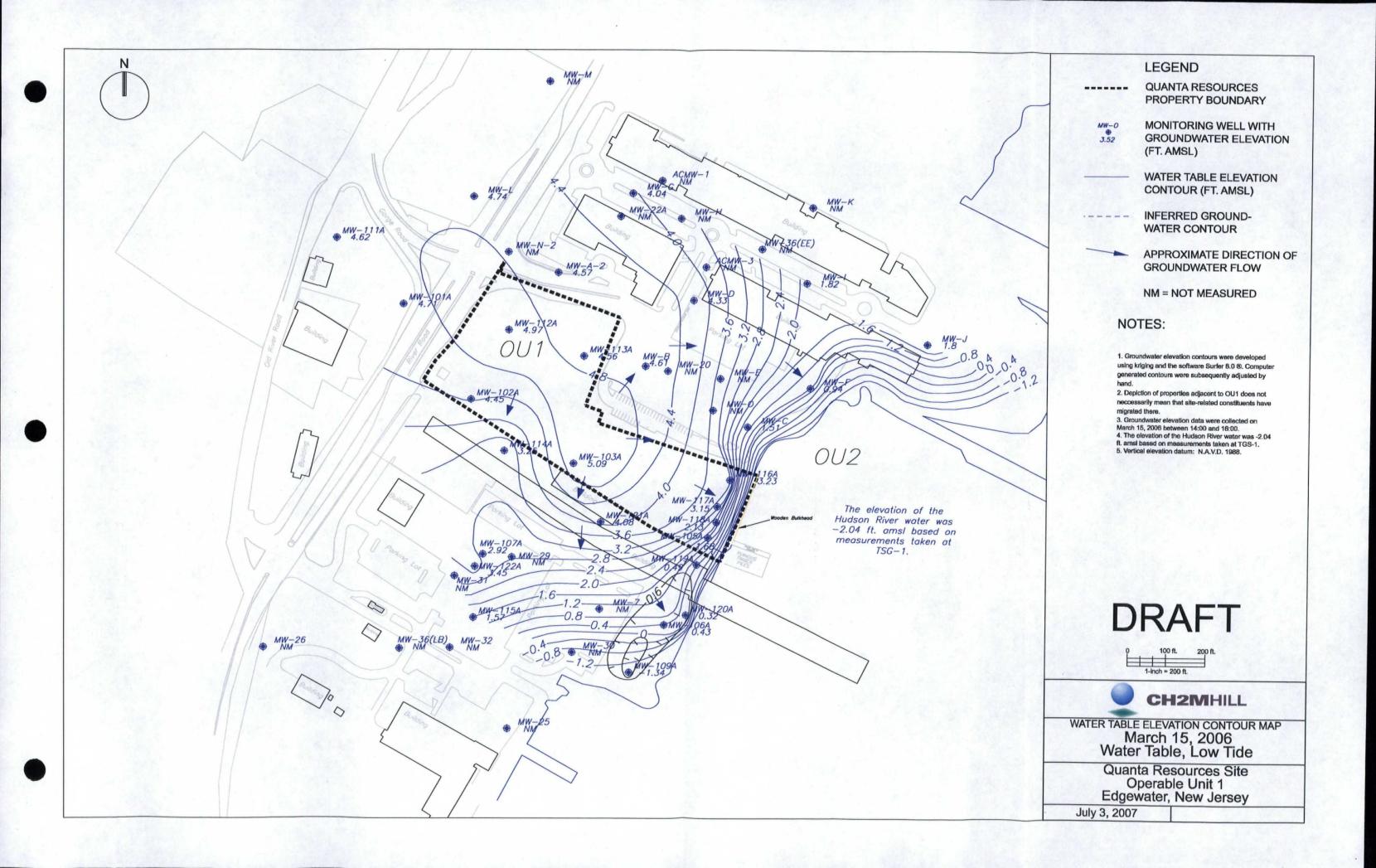


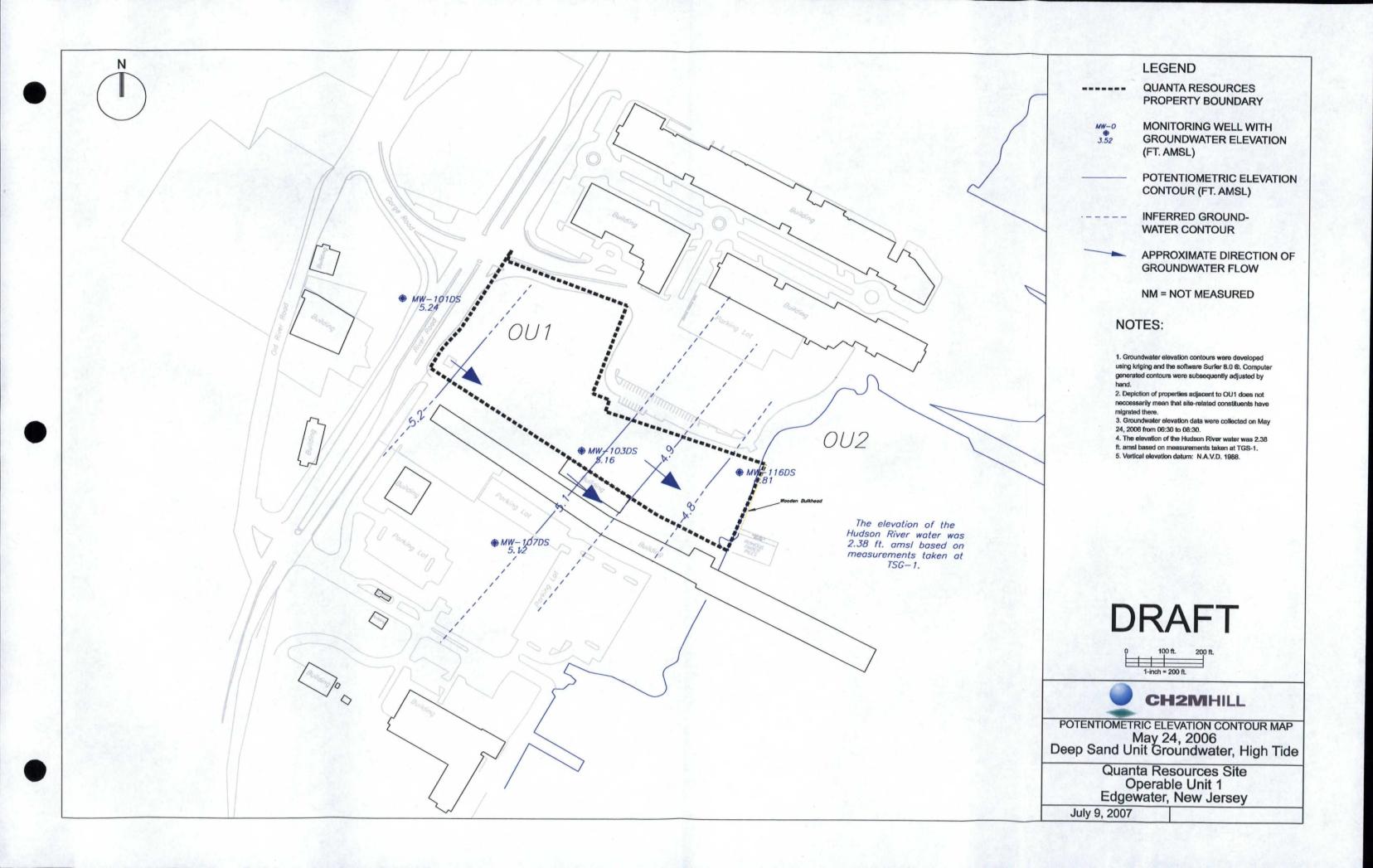


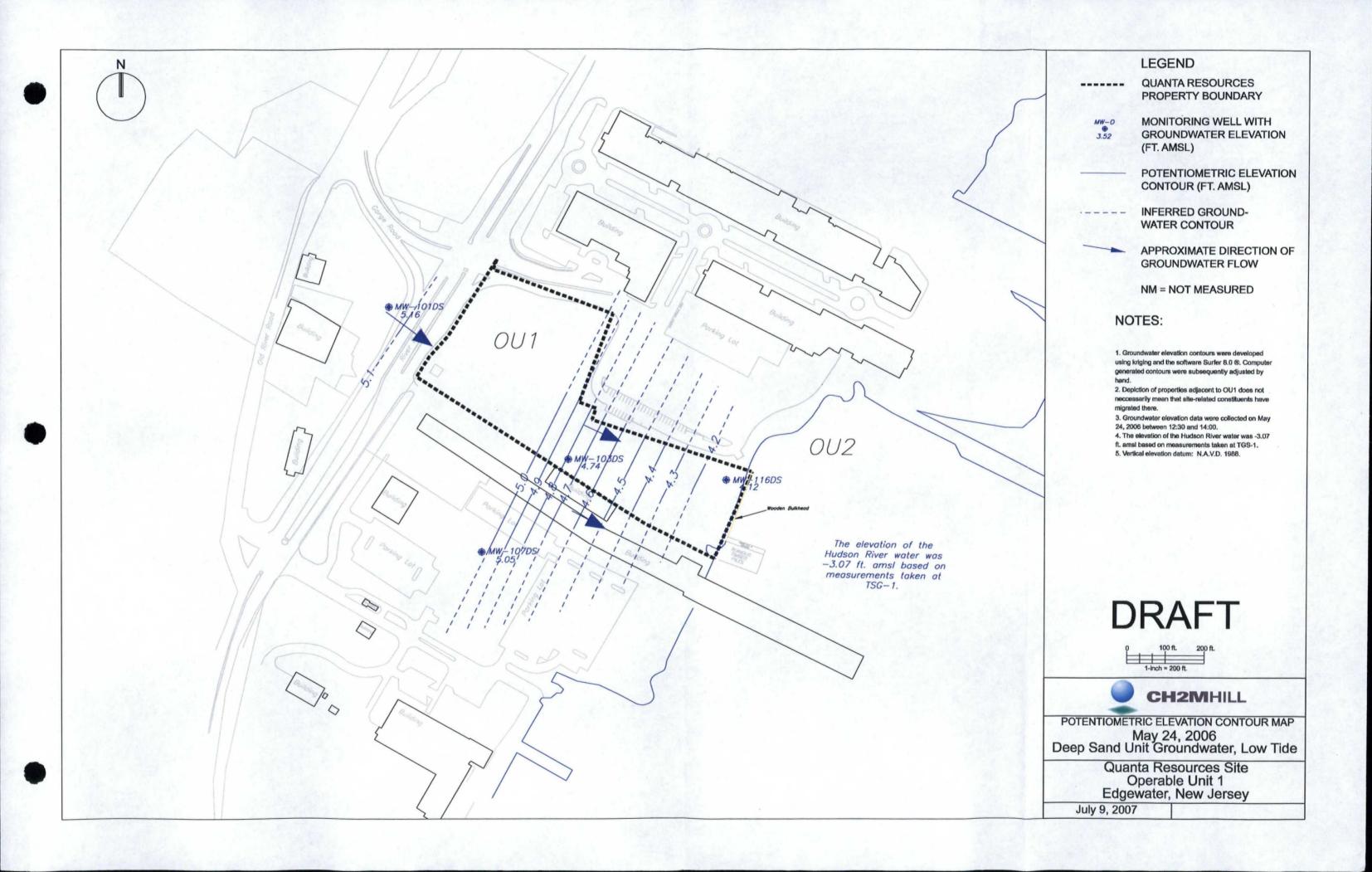




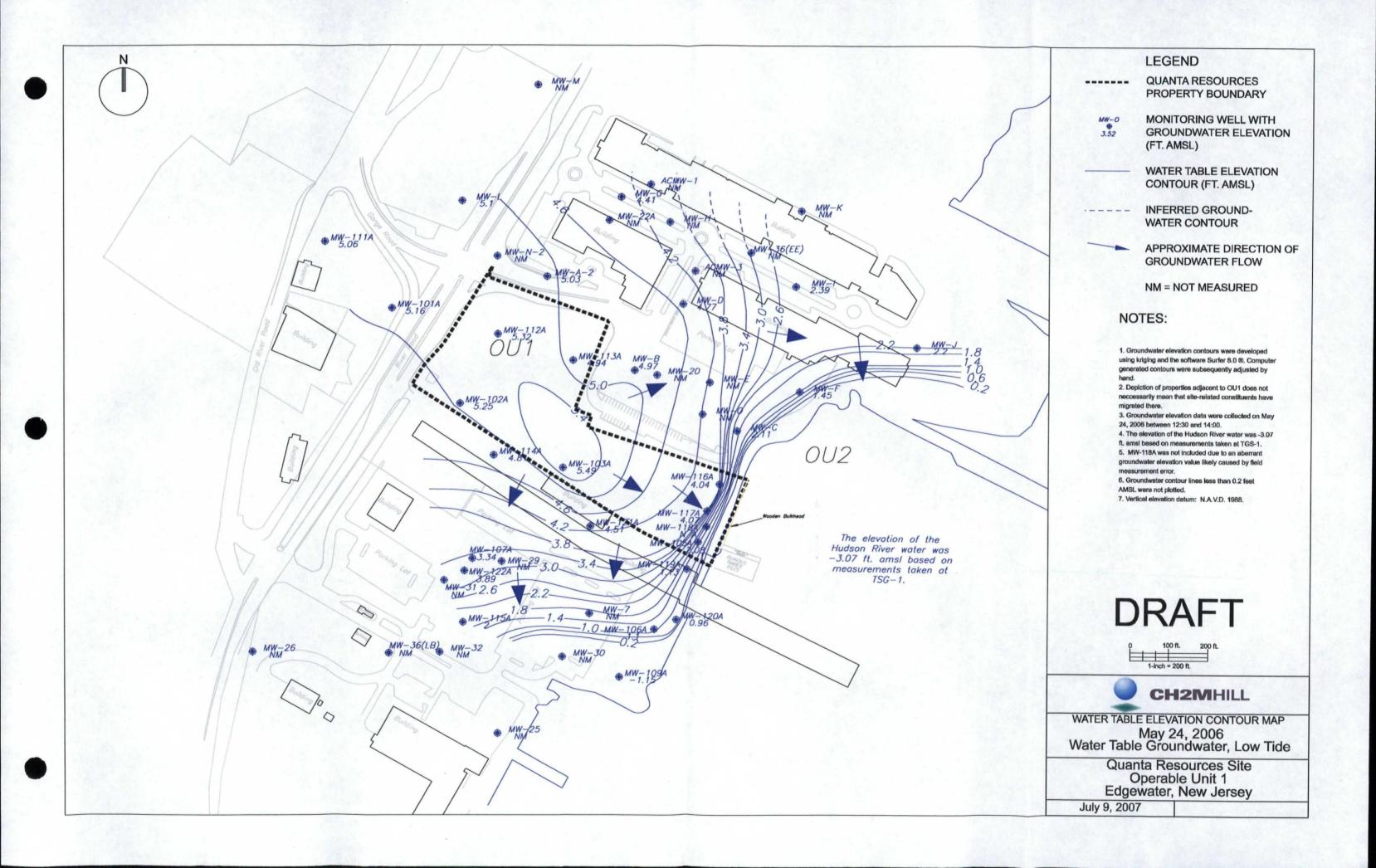


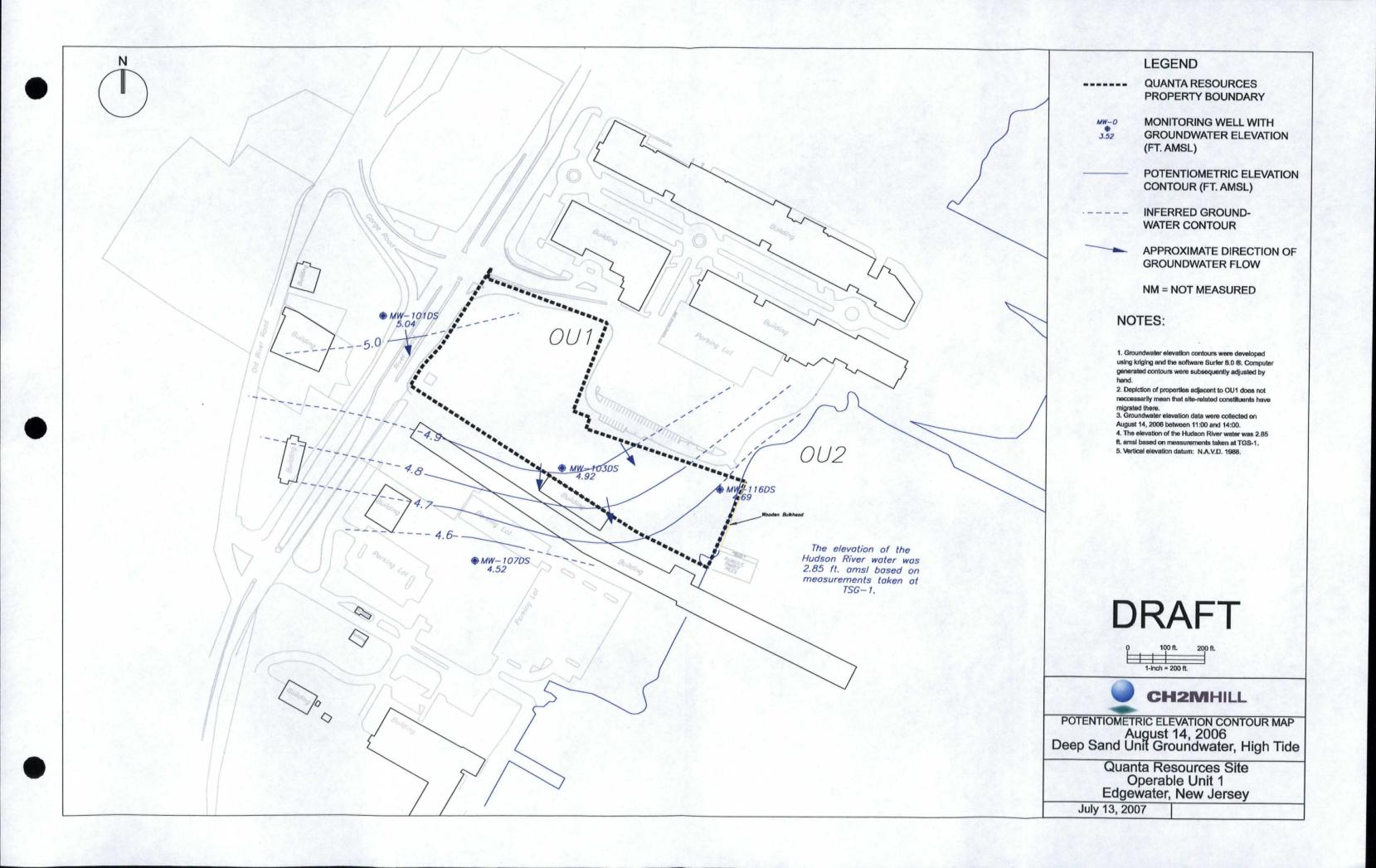


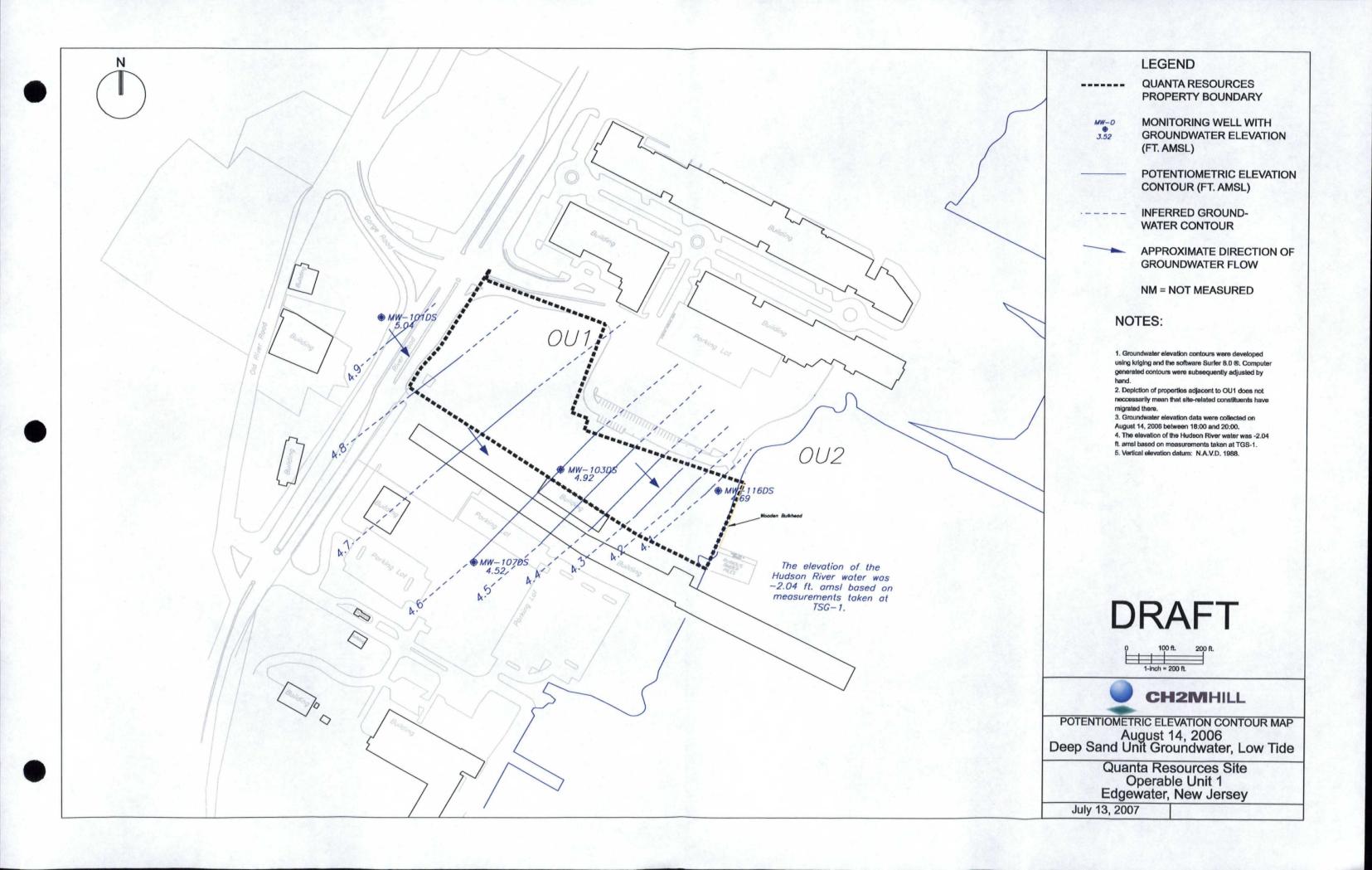


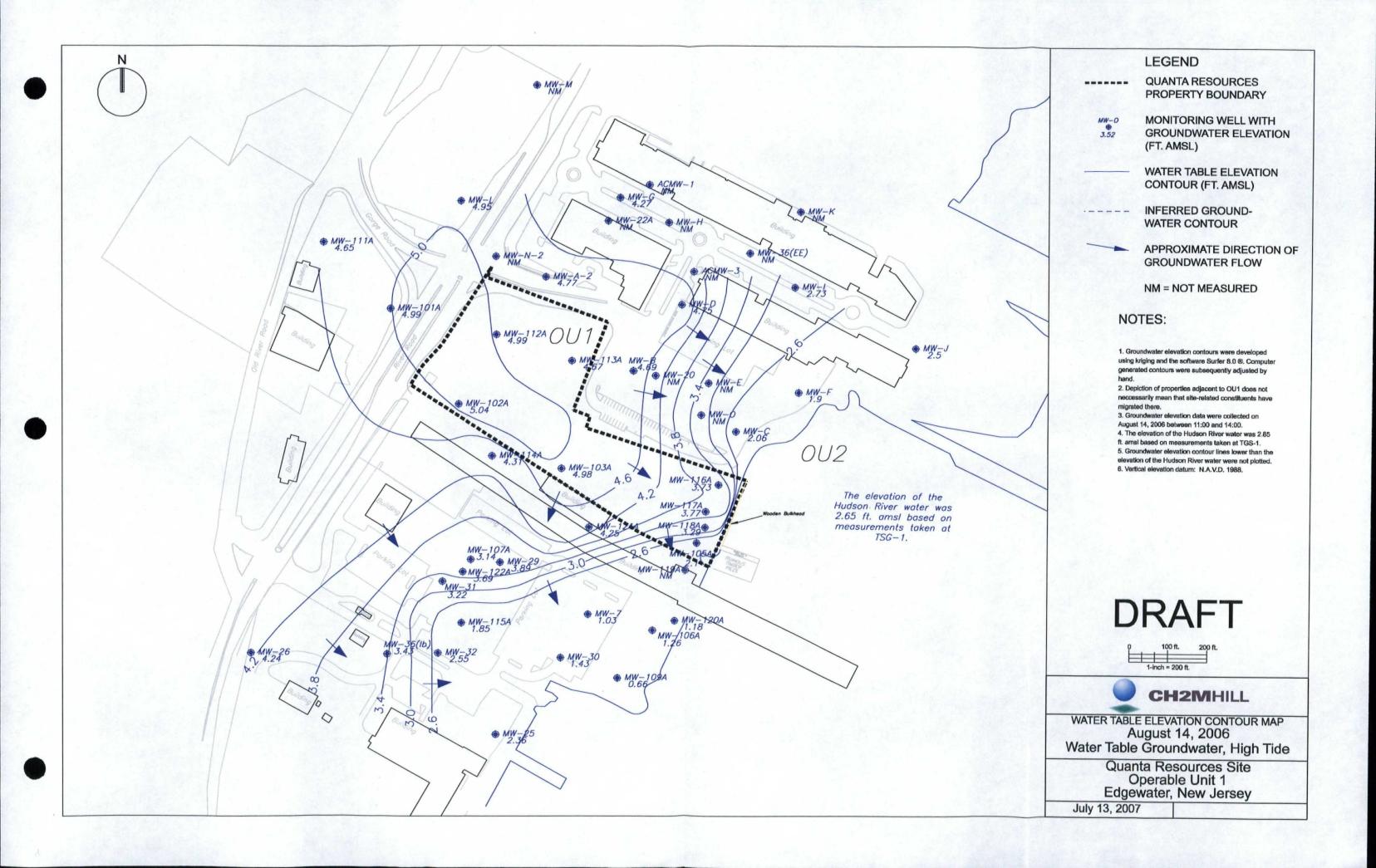


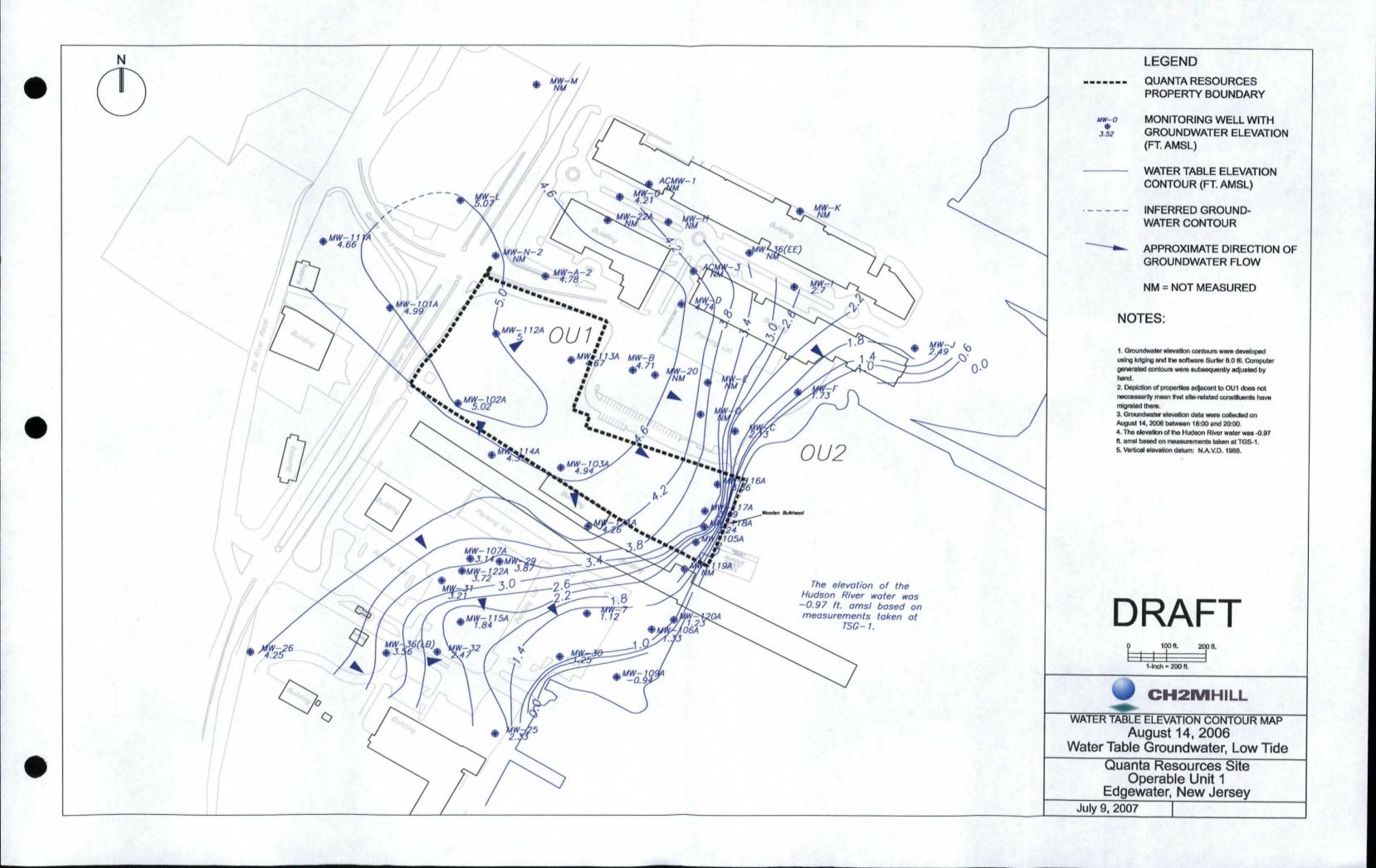












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Characterization of Cinder/Ash and Reddish-Purple Soils - Field Work Summary and Analytical Results Discussion

Quanta Resources Superfund Site, Operable Unit 1

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DATE: September 7, 2007

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Introduction

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From June 4, 2007 to June 6, 2007 field work was conducted at the Quanta Resources Superfund Site (the Site) in order to further characterize cinder/ash and reddish-purple soils that have been observed during previous subsurface investigations at the Site and documented in subsequent reports (e.g., CH2M HILL, 2006; Dan Raviv Associates, Inc., 2002; TRC Raviv Associates, 2004, GZA, 2007). This work was performed in accordance with the April 20, 2007 Remedial Investigation/ Feasibility Study (RI/FS) Work Plan Addendum No. 3 and Field Sampling Plan (FSP) for the Characterization of Cinder/Ash and Reddish-Purple Soils (the Work Plan) (CH2M HILL, 2007a) approved by the United States Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (MJDEP) (the "Agencies") in an email dated May 4, 2007. This technical memorandum is intended to supplement the work and discussions presented in a fechnical memorandum is intended to supplement the work and discussions presented in a moderation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils' sent to the Agencies on February 9, and Evaluation of Cinder/Ash and Pyrite Impacted Soils Soi

Field efforts associated with this work were combined with the Jono's Restaurant Vapor Intrusion Evaluation which involved the collection of groundwater grab samples for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) at Block 93 Morth. These data are provided and discussed under separate cover as part of the Jono's Restaurant Vapor Intrusion Evaluation. In some cases these groundwater grab locations were collocated with proposed soil sampling locations associated with the Cinder/ Ash investigations or were in close proximity to other proposed groundwater sampling locations outlined in the Proposed Scope of Work – Supplemental Data Gap Sampling (CH2M HILL, 2007a) (RI Work Plan Addendum No. 2).

results will be presented and discussed in the Jono's Vapor Intrusion Evaluation. Remedial Investigation Report. As mentioned above, VOC and SVOC groundwater data provided as part of the nature and extent and fate and transport discussions provided in the additional arsenic groundwater grab samples and the VOC and SVOC soil samples will be arsenic (and other potential constituents) to groundwater. Further discussion of the cinder/ash and reddish-purple¹ soils, and potential for these materials to act as a source of on the presentation, interpretation and discussion of the nature, extent, origin, of the additional data are presented herein. However, the focus of this technical memorandum is Proposed Scope of Work - Supplemental Data Gap Sampling (CH2M HILL, 2007c). These gaps associated with the delineation of various constituents in soil identified in the investigation were also analyzed for VOCs and/or SVOCs in an attempt to address data groundwater analyses, several soil samples collected as part of the Cinder/ Ash were also sent for the analysis of dissolved and total arsenic. In addition, to these additional analyzed for VOCs and SVOCs as part of the Jono's Restaurant vapor intrusion evaluation Supplemental Data Gap Sampling work, select groundwater samples collected and Data Gap Sampling (CH2M HILL, 2007c) and in order to enhance the efficiency of the future In consideration of the data gaps presented in the Proposed Scope of Work - Supplemental

Objectives

- The primary objective of these supplemental RI/FS activities was to provide the Agencies, by means of a balanced weight-of-evidence approach, with the conclusion that the investigations into the nature, extent, origin, of the cinder/ash and reddish-purple soils has been thorough and complete and has provided all the information that is needed with regard to remedial design.
- Secondarily, the objective of this work is to confirm the assertions presented in the 'Summary of the OUI Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/ Ash and Pyrite Impacted Soils Technical Memorandum (CH2M HILL, 2007b).
- This supplemental investigation includes the sampling/analysis of constituents unrelated to the former coal tar and oil recycling operations that were historically conducted at OUI that may have come to have been located within OUI, in order that they may be appropriately considered on-Site and addressed during future remedial efforts. The latter includes, but is not limited to, reddish-purple soils associated with the former General Chemical sulfuric acid plant, and polyaromatic hydrocarbons (PAHs) and metals impacts associated with coal ash, wood ash, slag, and other debris contained in historic fill deposits.

Field Work Activities

Utility Clearance

The New Jersey One Call utility mark out service was called prior to the commencement of the subsurface investigation activities. The New Jersey One Call service notified the

Reddish-purple soils refer to those materials that have a strong reddish color. The color of these soils is also referred to herein as dark red and/or dusky red.

following utilities: Time Warner Cable, Verizon, United Water New Jersey, PSE&G Gas Division, and Bergen County Department of Public Works. A 10- to 15-foot area around each soil boring location (other than the soil boring locations on the Quanta Resources property) was scanned for sub-surface utilities by Enviroscan of Lancaster, Pennsylvania to sugment the New Jersey One-Call service. Enviroscan used a Geophysical Software Systems, Inc. (GSSI) Surface Interface Radar ground penetrating radar unit fitted with 400 and 500 MHz antennae, a Fisher® TW-6 metal detector, and a Radiodetection® RD 4000 cable avoidance tool during their geophysical survey.

Soil Borings

A total of nine soil borings (SB-28 through SB-31, SB-34C, SB-35A, and SB-36 through SB-38) were advanced at a minimum to a depth that corresponded with the contact between the fill and the native deposits at each location. The one exception to this was at SB-34 where after 8 attempts resulting in shallow refusal, a maximum depth of only 5 feet was achieved due to the presence of building demolition debris. Locations of each of the borings are illustrated on the attached Figure 1.

Drilling services were provided by SGS Environmental Services, Inc. of West Creek, New Jersey (SGS). Soil samples were collected continuously at 5-foot intervals using a Geoprober macrosampler with a disposable acetate liner. Soil samples were classified by the onsite CH2M HILL geologist in general accordance with the Unified Soil Classification System using the procedures described in American Society of Testing and Materials (ASTM) D2488-69 "Description of Soils (Visual-Manual Procedure)." Soil samples were containing information about lithology, visual evidence of impacts, PID screening results, and general drilling conditions were maintained for each soil boring. In addition to the soil boring logs, photographs were taken to further document the characteristics of the soil surface soils, especially the soils which were targeted and collected for analytical sampling. A copy of the boring logs is included in Appendix A. Soil boring logs with associated photographs of samples and retrieved soil cores are provided in Appendix B. Upon boring completion, soil borings were backfilled with hydrated bentonite chips.

Soil Sampling

Per the FSP, the recovered soil was carefully inspected for the presence of cinders, slag, and/or reddish-purple soils (targeted materials) which were the primary subjects of the investigation. If necessary, a spray bottle containing deionized water was used to wash loose material from larger objects in order to better identify the presence of cinder, and/or slag. When the targeted materials were present, only the interval of soil visually identified to contain the targeted materials was included in the sample interval in order to assure mineralogical and analytical results were not biased by the inclusion of soils from adjacent intervals. When a soil interval containing some or all of the targeted materials was observed the entire soil interval containing these materials was placed in a disposable aluminum pan, thoroughly homogenized, and transferred to the required sample containers for the analyses specified in the Work Plan.

In accordance with the Work Plan, intervals containing the targeted materials that spanned both the vadose and saturated soil zones were divided in two and separate samples were

collected from both the saturated and unsaturated zones. Sampled soil intervals from both zones were analyzed for USEPA SW-846 Target Analytical List (TAL) Metals using USEPA Methods 6010B and 7470A, and total organic carbon (TOC) content using USEPA Methods 6010B and 7470A, and total organic carbon (TOC) content using USEPA Methods 6010B and 7470A, and total organic carbon (TOC) content using USEPA Methods of the types of materials mineralogy and Thin Section Petrography to identify and characterize the fabric and texture of these mineral matrices. Where possible, Thin Section Petrography samples were taken by removing a portion of the soil core (approximately 3 inches in length) from within the sampled interval prior to homogenization and packaging these intact cores in saran, placing them in a jar and shipping them to the laboratory. The cohesiveness of the sampled soils only allowed for the employment of this method for the three samples collected at SB-36 (0.8-1.2 ft. bgs, 1.2-2.2 ft. bgs, and 3.2-5.2 ft. bgs). The leachate from unsaturated soil samples were also analyzed for TAL metals via USEPA Methods 1312/6010B and 7470A using the Synthetic Precipitation Leachate Procedure (SPLP).

A total of 18 soil samples were collected for laboratory analysis and were delivered to Accutest Laboratory in Dayton, New Jersey (NJDEP certification number 12129) (Accutest Laboratory) via laboratory courier under executed chain-of-custody forms. Splits of each of these soil samples were shipped via Fed Ex under chain-of-custody protocol to Mineralogy, Inc.) for XRD analysis and Thin Section Petrography.

In order to address data gaps identified in the Proposed Scope of Work – Supplemental Data Gap Sampling (CH2M HILL, March, 22, 2007) 3 of the 18 soil samples (SB-28 - 5.6-7.0 ft., SB-29 - 5.0-8.4 ft., and SB-30 - 1.5-3.5 ft.) were also sent to Accutest Laboratory for the analysis of SVOCs using USEPA Method 8270. The sample collected from SB-30 from 1.5-3.5 ft. bgs was also analyzed for VOCs via USEPA Method 8260.

A list of all boring locations, the samples that were taken and analyses that were performed for each is provided in Table 1 along with the data quality objectives originally specified in the Work Plan and the Proposed Scope of Work – Supplemental Data Gap Sampling (CH2M HILL, 2007c).

Temporary Well Installations and Groundwater Grab Sampling

At 5 of the 6 locations where groundwater grab samples were collected from temporary well locations as part of the Jono's Vapor Intrusion Evaluation groundwater samples were also collected for the analysis of total and dissolved arsenic (TWP-SB-28, 29, 30, 31 and 32). The locations of temporary well locations are illustrated on Figure 1. In general, temporary wells collocated with borings where soil sampling was performed were installed within 5 feet of the soil boring used for soil characterization and sampling.

Temporary wells were installed by driving a 3.25-inch diameter steel casing using a direct-push drill rig to a specified depth no deeper than 5.5 feet below the water table (9.5 ft. bgs). A 1-foot long, 1-inch diameter schedule 40 polyvinyl chloride (PVC) pre-packed well screen was placed in the bottom of the borehole with 1-inch diameter threaded PVC riser extending above the groundsurface. The casing was removed and formation soils were extending above the groundsurface. The casing was removed and formation soils were allowed to collapse around the pre-packed screen and riser. Originally, 1-foot screens

associated with the temporary monitoring wells were to be installed at shallower depths such that the screens were just below the water table (5-6 feet bgs). This was attempted at location TWP-SB-33, however, the length of the well screen, the limited hydraulic conductivity of the saturated soils and the inability to create a significant hydraulic head variance between the shallow well and the adjacent formation resulted in very low recharge rates. As a result, purging and sampling at this location took approximately 10 hours. As a result the remainder of the temporary well points were installed to slightly greater depths that were no deeper than approximately 5.5 feet below the water table.

Following installation each temporary well was sampled using a peristaltic pump and disposable polyethylene tubing in accordance with USEPA Region II Low Flow protocol. Field parameters (pH, temperature, conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity) were measured using a flow through cell coupled with a YSI 556 Multiprobe System and a Lamotte 2020 turbidity meter.

Following stabilization of the field parameters a field-filtered groundwater sample (preserved with nitric acid) and non-field-filtered (non-preserved) groundwater sample was collected at each location prior to the flow-thru cell. Groundwater samples were immediately place on ice and sent to Accutest Laboratory via laboratory courier under executed chain-of-custody forms. Both field-filtered and non-field-filtered samples were analyzed for arsenic via USEPA Methods SW6020. A summary of the screened intervals for each temporary well, the groundwater samples collected as part of this field event as well as the data quality objectives for each groundwater sample are summarized in Table 2. Temporary well construction details for those points where groundwater samples were collected for arsenic are also provided in the boring logs included herein as Appendix A. A summary of the field parameter readings following stabilization and prior to sampling as are summarized in Table 3.

Deviations from the Work Plan

This section describes those activities or procedures that were not performed in accordance with the Work Plan. In addition, this section also provides details on work that was performed above and beyond the scope of the Work Plan in the hopes of enhancing the characterization of the cinder/ash and reddish-purple soils.

- SB-34 on the former Lever Brothers: Eight attempts were made to drill to a depth that corresponded with the native materials. Due to repeated drilling refusals believed to be caused by the presence of the building demolition debris (i.e. concrete, and brick) that was graded in place at this location, a depth of no greater than 5 feet below ground surface (bgs) could be reached. As a result saturated soils were not encountered. The three locations where one or more attempts were made to get down in this area are illustrated on Figure 1 as SB-34A, SB-34B, and SB-34C. Slag was detected in the unsaturated fill material above and within this debris at location SB-34C. This material was sampled in accordance with the Work Plan. A boring log for SB-34C with associated photographs is provided in Appendix B.
- SB-35: Although the soil boring log from MW-109 (GeoSyntec, 1999) indicated the presence of "cinders" from the ground surface to 18 feet bgs no cinders, slag, ash, coal or reddish-purple soils (targeted materials) were observed in either of the 2

borings drilled within 15 feet of MW-109 to depths of 15 feet bgs each. Each boring was located within at least 17 feet of MW-109 and was advanced to a depth of 15 feet bgs. The locations of these borings are illustrated on Figure 1 as SB-35A and SB-35B. Both borings were found to contain almost identical lithology. A boring log for SB-35A with associated photographs is presented in Appendix B.

- SB-37: No cinders, slag, ash, coal or reddish-purple soils (targeted materials) were
 observed above the water table; therefore, no vadose zone soil sample was collected.
 A saturated sample of reddish-purple soils also containing slag was collected from
 this location.
- Due to the absence of targeted materials in the observed soils at SB-35A and SB-35B reconnaissance of the eroding shoreline adjacent to the Hudson River was performed to see if an understanding of the composition of these fill materials could be ascertained from the cut banks along the river. Inspection of the materials within and adjacent to the eroding banks approximately 75 to the east of MW-109 and continuing to the north to the boundary with the 115 River Road revealed the presence of an abundance of vesicular glassy slag material as well as pieces of hard asphaltic material intermixed within the eroding fills and present along with gravel and cobbles on the adjacent shoreline. After soliciting and receiving approval from David Winslow of GZA Environmental of New York, a sample of the glassy slag material was taken (SLG-01) by collecting several pieces of the slag immediately adjacent to the eroding bank, crushing them, placing the material in the appropriate sample jars. Similar to other samples SLG-01 was placed in a cooler with ice and couriered under standard chain-of-custody protocol to Accutest Laboratory for the analysis of TAL metals via USEPA Methods 6010B and 7470A, and for TOC content using USEPA Method SW846 9060. The leachate from this sample was also analyzed for TAL metals via USEPA Methods 1312/6010B and 7470A using the SPLP. Several intact pieces of the glassy slag (not crushed) were also sent to Mineralogy, Inc. for further analysis using x-ray diffraction (XRD) (bulk & clay fraction) and Thin Section Petrography.

This sample was not specified in the Work Plan, but was collected to examine the correlation, if any, between the surficial slag material on the northern shoreline of the former Lever Brothers property and any other of the targeted soils collected during this investigation. The approximate location of where this sample was collected is illustrated on Figure 1. Photographs of the shoreline area and the sampled glassy slag material are included in Appendix B.

Results

Field Observations

Of the nine (9) locations that were drilled as part of this investigation all but 2 locations contained at least one interval of fill with slag. Commonly, the fill material containing slag was observed as brown to black sands and gravels with trace amounts of silt sometimes containing crushed brick and coal fragments. The observed thickness of these intervals ranged from 0.7 feet at SB-34C to 11 feet at SB-30. Slag material ranged in size from several

millimeters to greater than 1-inch in diameter and were amorphous, glassy grey to reddish-brown particles with an abundance of vesicles. These fill deposits were typically found directly above the native deposits consisting of clayey silt with organics (meadow mat) that represent the surface of the former tidal wetlands. Soft plastic tar was also present within these fill deposits and above the native meadow mat deposits at SB-29, SB-30, and SB-31. Non-aqueous phase liquid (NAPL) was also observed in the soil above the meadow mat from 10 to 12 feet at SB-30. Pictures of these materials in context of their boring logs are provided in Appendix B.

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Reddish-purple soils were observed at 3 locations drilled in the northwest portion of Quanta property (SB-36, SB-37, and SB-38). The soils at SB-36 were observed as very dusk red, dry, dense fine to coarse sand with trace gravel, mottled with pale yellow and pockets of homogeneous fine to coarse yellow crystals. At SB-37 and SB-38 the soils were dusky red to dark red, saturated, loose coarse sand and gravel. Split samples of the materials at SB-38 were washed to remove the fines in order to better inspect the sand and gravel sized particles. The washed gravels were reddish-purple and grey with trace light brown and pale yellow gravel-sized particles. The dusky red horizons were encountered between 1.2 (SB-36) and 3.9 feet bgs (SB-37) and ranged in thickness from 1.1 feet at SB-37 to 5.6 feet at SB-38. Dusky red soils graded with depth to brown and black fill consisting of fine to coarse sand and gravel with trace brick, coal and slag. These deeper brown and black fills were similar to those see at locations drilled at the other properties as part of this work (see above) and similarly were found residing directly above the native meadow mat deposits. At the base of the dusky red interval and just above where the soils graded to brown and black fills a 0.5 to 1 foot interval of white to pale brown silt-like material (possibly gypsum) was observed at SB-36 (5 to 6 ft. bgs) and SB-38 (7.5 to 8 ft. bgs). NAPL was also observed at approximately 8 to 9 feet bgs above the meadow mat at SB-38. Pictures of the materials observed and sampled at each of these locations and the boring logs for each location are provided in Appendix B.

Mineralogy

Samples of fill material containing slag as well as the reddish-purple soils as described above were analyzed using XRD and Thin Section Petrography. A summary of the samples collected and analyzed for XRD and Thin Section Petrography is provided in Table 1. XRD analyses covered both the bulk & clay fractions in order to provide a semi-quantitative assessment of the mineralogy of each sample that included the characterization of individual clay mineral species. A summary of the XRD results for all samples and a soil description for each of the intervals are provided in Table 4. Thin Section Petrography is a transmitted light, optical microscopy descriptive technique that characterizes the mineralogy as a function of sediment texture and fabric. These analyses were performed in order to better understand the mineralogical characteristics and signatures of slag-containing fills and reddish-purple soils across the study area, and to determine, if any, what similarities exist between the two. A copy of the report provided by Mineralogy Inc. containing photographs of the thin section plates for each sample as well as narratives describing the fabric, framework grain constituents, cements and matrix constituents and the pore systems observed for each plate is provided herein as Appendix C.

XRD results from the majority of the samples collected indicated appreciable amounts of quartz and amorphous material with an absence of crystalline structure (glass). Samples of the black fill materials containing slag are between 30 and 60 percent amorphous glass with lesser amounts of quartz, feldspars, and mullite. Mullite comprises between 5 and 24 percent of these samples and is an aluminum silicate mineral that is produced artificially during heating. The dominance of amorphous material and mullite within these soils confirm that they have an abundance of glassy slag. Consistent with this assertion are the results from the sample of slag collected from the northern shoreline at the former Lever Brothers property (SLG-01) where mullite (19%) and amorphous glass (73%) make up 92 percent of this sample.

Slag is a byproduct of the smelting of ores and was a common material that was used in rail road track ballast and appears to have been a major component of the fill that was used in this area during the development of rail lines and initial industry along the banks of the Hudson River.

Samples of the reddish-purple soil intervals observed at SB-36, SB-37, and SB-38 had notably lesser amounts of amorphous material (between 10 and 20 percent) and mullite (not present to 3 percent). Also distinguishing these samples from those collected elsewhere are their elevated hematite content (up to 77 percent) as well as varying amounts of pyrite, jarosite, gypsum, and in one case, sulfur (SB-36-1.7).

Further evaluation of the samples using Thin Section Petrography shows the grain constituents of the black slag-rich fill consist of black glass and iron-rich slag fragments with common inclusions of mullite crystals, plutonic rock fragments, quartz, feldspar, bitumen (asphalt and/or coal tar) and recycled concrete fragments. The intergranular cements of these soils are dominated by hematite (iron oxide) and bitumen which in some cases marginally encrust the slag particles and rock fragments. The exceptions to this are the samples collected at SB-34C and SLG-01, neither of which indicated the presence of bitumen but where hematite did occur as a minor cement type that encrusted the slag particles and was present as pore-lining cement within selected gas-entrapment voids associated with the slag particles.

The samples collected from intervals of reddish-purple soils show similar grain constituents comprising their framework as those observed in the black slag-rich fills. Grain constituents for these samples were dominated by black glass and iron-rich slag fragments with iron-oxide fragments, quartz, and feldspar. Mullite crystals were not observed in the thin sections of reddish-purple soil samples and plutonic rock fragments and bitumen were less abundant than in the black slag-rich fills. SB-38-2.5 also showed the presence of gypsum-rich rock fragments. In general, the dominant intergranular cement is hematite with varying amounts of pyrite and jarosite. Pyrite (FeS₂) and jarosite (KFe₃(SO₄)₂(OH)₄) are also_present as secondary void-filling cement associated with selected slag particles. Bitumen is present in select samples from above and below the reddish-purple soil intervals as widespread staining (SB-36-1.0), and as discrete particles encrusting the slag fragments (SB-38-9.5). Bitumen was only observed in one reddish-purple soil interval sample as an intergranular cement (SB-36-1.7). The two deepest samples collected from SB-38 (SB-38-5.4 and SB-38-9.5) also showed amounts of gypsum was present as an intergranular cement or as a void filling cement associated with the hematite dominated slag fragments.

Samples not visually identified in the field as containing slag or having a reddish-purple color (SB-29-1.9, SB-29-6.7, SB-30-2.5, SB-36-1.0, and SB-38-9.5) were identified through XRD and Thin Section Petrography to contain significant quantities of glass and mullite-rich slag fragments. Samples SB-36-1.0, SB-36-6.3, and SB-38-9.5 were found immediately above or below intervals of reddish-purple soil and showed the effects of their proximity to these intervals in their mineralogical composition and structure. Specifically, these samples contained between 1 and 8 percent jarosite and SB-36-1.0 also had 1 percent pyrite. The absence of the reddish-purple coloration is likely a result of the lack of hematite which ranged from undetectable amounts at SB-38-9.5 to 5 percent at SB-36-6.3.

Analytical Results

The laboratory analytical sample splits were collected as part of the approved Work Plan for the analysis TAL metals using USEPA Methods 6010B and 7470A, and TOC content using USEPA Method SW846 9060. The leachate from unsaturated soil samples was also analyzed for TAL metals via USEPA Methods 1312/6010B and 7470A using SPLP. A summary of the laboratory analytical analyses performed for each sample is provided in Table 1. Summaries of laboratory analytical results are provided in Tables 5A through 5D. A figure depicting the analytical results for soil samples collected as part of the Work Plan is provided as Figure 2. As part of data gaps and Data Quality Objectives set forth in the Proposed Scope of Work – Supplemental Data Gap Sampling (CH2M HILL, March 22, 2007) (RI Addendum No. 2) select samples from borings SB-28, SB-29, and SB-30 were analyzed for SVOCs using USEPA Method 8270 and one sample from SB-30 was analyzed for VOCs using USEPA Method 8260. Soil data for VOC and SVOC analyses are presented in the data tables contained herein (Tables 5C and 5D) but are discussed under separate cover.

For the purpose of evaluating analytical differences between samples comprised of black slag-rich fill and the reddish-purple soils the results for each of these sample sets are discussed below separately.

Black/Brown Slag-Rich Fills

A total of 6 samples from outside the historically mapped footprint of the former acid plant² were visually identified in the field as brown to black fills containing slag (SB-28-3.4, SB-28-6.3, SB-30-9.5, SB-31-1.1, SB-31-6.0, SB-34-1.3). Three additional samples were collected from brown to black fill intervals where slag was not visually identified at the time of sampling (SB-29-1.9, SB-29-6.7, SB-30-2.5). Despite the fact that slag was visually observed in only 6 of these 9 samples from across 6 locations, XRD and petrographic analyses showed that all 9 contained an abundance of glass-rich slag fragments. Additional intervals of brown/black fill material are also represented by samples SB-36-1.0, SB-36-6.3, and SB-38-9.5 however, XRD and Thin Section Petrography results for these samples showed similarities in their mineralogical composition and structure to the reddish-purple soils. This is due to the fact that they were found within the soil column directly above or below intervals of reddish-purple soil. Because these soils were located immediately adjacent to intervals of reddish-purple soil within the footprint of the former acid plant operation and have evidence of impacts associated with the reddish-purple soils these samples have not been included in

² The extent of the footprint of the former acid plant has been approximated from historical insurance maps (Sanborn® Fire Insurance Maps for 1911 and 1930, and a 1958 Insurance Map of the General Chemical Plant).

the data set that represents the ubiquitous brown/black fill deposits across each of the properties.

Results for the 9 samples of slag-rich black/brown fill collected from Block 93 (North), the Former Lever Brothers property showed exceedances of the lowest of the industrial and residential USEPA Region 9 Preliminary Remediation Goals (PRGs) and NJDEP Soil Cleanup Criteria for antimony, arsenic, copper, iron, and lead. The minimum, maximum, and geometric mean concentrations of metals for these 9 samples relative to Region 9 PRGs and NJDEP Soil Cleanup criteria are presented in Table 6.

Total arsenic results for samples of the black/brown slag-rich fills ranged from 16.2 to 988 mg/kg. Arsenic levels were higher at shallower depths in 2 of the 4 locations where more than one depth interval of black/brown slag-rich fill was sampled. Total arsenic results from all 9 samples analyzed exceeded the USEPA Region 9 residential and industrial clean up criteria of 0.39 and 1.6 mg/kg, respectively. Eight of the 9 samples exceeded the NJDEP residential and non-residential direct contact Soil Cleanup Criteria of 20 mg/kg.

Total lead results for soils ranged from 30.5 to 12,200 mg/kg. Total lead levels were higher at shallower depths in 3 of the 4 boring locations where more than one depth interval of the black/brown slag-rich fill was sampled. Two of the 9 samples exceeded the NJDEP residential Soil Cleanup Criteria of 400 mg/kg and the USEPA Region 9 residential Soil Cleanup Criteria of 400 mg/kg. Those same 2 samples also exceeded the NJDEP non-residential direct Soil Cleanup Criteria of 600 mg/kg and the USEPA Region 9 industrial Soil Cleanup Criteria of 800 mg/kg.

Total iron results for soils ranged from 10,200 to 83,900 mg/kg. Three of the 9 samples exceeded the USEPA Region 9 residential Soil Cleanup Criteria of 24,000 mg/kg. None of the samples exceeded the USEPA Region 9 industrial Soil Cleanup Criteria of 100,000 mg/kg. The NJDEP has not developed soil clean-up criteria for iron.

Antimony and copper results for the 9 samples of the brown/black fill ranged from non-detect to 16 mg/kg and 25 to 657 mg/kg, respectively. Concentrations of antimony were at or slightly above the NJDEP residential Soil Cleanup Criteria (14 mg/kg) in two samples collected from SB-29. Copper concentrations were above the NJDEP residential and industrial Soil Cleanup Criteria (both 600 mg/kg) in only one sample collected from SB-29. No soil analytical results for copper or antimony were above the USEPA Region 9 residential or industrial Soil Cleanup Criteria.

Samples of the unsaturated intervals of the brown/black fill containing slag were collected at SB-28, SB-30, SB-31 and SB-34C for SPLP analysis. Analytical results for the leachate of these soils indicated detectable concentrations of the following constituents above the lower of the NJDEP Class II Groundwater Quality Criteria (GWQC) and the USEPA Region 9 Drinking Water PRGs for the following metals.

- aluminum
- antimony
- arsenic
- iron
- lead

Of these metals aluminum and arsenic were the two constituents with the highest measured concentrations. Concentrations of arsenic were above both the NJDEP GWQC (3 μ g/l) and the USEPA Region 9 tap Water PRG (0.045 μ g/l) in all but one of the samples, and ranged between non-detect at SB-31 and 1,200 μ g/l at SB-34C. Similarly, aluminum was detected in the leachate from the same 3 samples above the NJDEP GWQC (200 μ g/l) at concentrations ranging from 860 at SB-34C to 1,700 μ g/l at SB-28. Antimony was detected in one sample (SB-31-1.1) above the NJDEP GWQC (6 μ g/l) and the USEPA Region 9 Tap Water PRG (14.6 μ g/l) at concentrations of 26 μ g/l. Iron and lead were detected in the leachate from the sample collected at SB-30 and exceeded the NJDEP GWQC (iron 300 μ g/l, lead 5 μ g/l) in this sample at concentrations of 720 and 7 μ g/l, respectively.

SPLP data will be evaluated and discussed further in context of the soil data discussed herein as part of the fate and transport section of the RI Report.

Reddish-Purple Soils

A total of 8 samples were collected from 3 locations as part of the Work Plan within the lateral extents of where intervals of reddish-purple soils have previously been documented as part of RI activities and investigative work performed at adjacent properties. This group of samples represents those collected from the northwest portion of the Quanta property where the presence of reddish-purple soils was observed both during this event and during previous sampling events. These samples were also collected in areas where historical maps indicate the former acid plant once existed and where, according to these maps, pyrite ore was stored and roasted. Of these 8 samples, 5 (SB-36-1.7, SB-36-4.2, and SB-37-4.5, SB-38-2.5, and SB-38-5.4) were documented to have been collected directly from discrete intervals of reddish-purple or dusky red discolored soils. Three additional samples (SB-36-1.0, SB-36-6.3, and SB-38-9.5) were collected from intervals of brown/black fill immediately above or below the sampled reddish-purple soil intervals and showed some similar mineralogical characteristics associated with the adjacent reddish-purple soils. These 2 subsets of samples have been evaluated separately but are discussed in context of each other in the following paragraphs.

Results from the majority of samples collected in this area indicated consistently elevated levels of antimony, arsenic, copper, iron, lead, and thallium. The 5 samples collected directly from intervals of reddish-purple soils showed one or more exceedances of the lowest of the industrial and residential USEPA Region 9 PRGs and NJDEP Soil Cleanup Criteria for antimony, arsenic, barium, copper, iron, lead, and thallium. The 3 samples collected above or below these intervals had one or more exceedance of the lower of these criteria for the same metals with the exception of barium. Zinc was also detected above the NJDEP residential and industrial Soil Cleanup Criteria in one sample collected below the reddish-purple soils at SB-38. Table 6 presents the minimum, maximum, and geometric mean concentrations of metals relative to Region 9 PRGs and NJDEP Soil Cleanup criteria for these two data sets in addition to these values for the samples of brown/black slag-rich discussed above.

Arsenic concentrations in the 5 samples of reddish-purple soils were all above the industrial and residential NJDEP Soil Cleanup Criteria and USEPA PRGs and ranged from 648 to 5,870 mg/kg. Although concentrations of arsenic in the 3 samples collected in non-reddish-

purple soils adjacent to these impacts were lower they were also above all NJDEP and USEPA soil cleanup criteria with concentrations ranging between 83 and 947 mg/kg.

Total lead results for the reddish-purple soils ranged from 2,640 to 9,640 mg/kg with generally lower concentrations in adjacent soils that ranged from 115 to 11,400 mg/kg. With the exception of one sample (SB-38-9.5), all samples collected within or adjacent to intervals of reddish-purple soils exceeded the NJDEP residential direct Soil Cleanup Criteria and the USEPA Region 9 residential PRG for lead (both 400 mg/kg) as well as the NJDEP non-residential Direct Soil Cleanup Criteria (600 mg/kg) and the USEPA Region 9 Industrial PRG (800 mg/kg) for this metal.

Iron results ranged from 81,100 to 294,000 mg/kg for reddish-purple soil samples with generally lower concentrations (ranging from 23,100 to 47,400 mg/kg) in adjacent non-reddish-purple intervals. Seven of the 8 samples collected within or adjacent to intervals of reddish-purple soils exceeded the USEPA Region 9 Residential PRG for iron of 24,000 mg/kg. Four samples from within reddish-purple intervals also exceeded the USEPA Region 9 Industrial PRG of 100,000 mg/kg.

Antimony results were generally consistent between samples collected both within and adjacent to reddish-purple soil intervals with concentrations ranging from non-detect to 229 mg/kg. Seven of these 8 samples exceeded the USEPA Region 9 residential PRG for antimony (14 mg/kg). Concentrations of antimony in all 8 samples were below NJDEP and USEPA Region 9 PRG industrial Soil Criteria of 340 mg/kg and 410 mg/kg, respectively.

Barium results ranged from 322 to 1,150 mg/kg for reddish-purple soil samples and from 95 to 383 mg/kg for the adjacent interval samples. Exceedances of NJDEP residential Soil Cleanup Criteria for barium (700 mg/kg) were observed in 3 samples of the reddish-purple soil intervals. None of the samples had results for barium that exceeded the NJDEP industrial Soil Criteria (47,000 mg/kg) or USEPA Region 9 PRGs for residential (5,400 mg/kg) and industrial (67,000 mg/kg).

Thallium and zinc concentrations exceeded the NJDEP residential and industrial Soil Cleanup Criteria (both residential and industrial criteria are 2 mg/kg and 1,500 mg/kg for thallium and zinc, respectively) in one sample each. Thallium was detected in the reddish-purple soil interval at SB-36 at a concentration of 49 mg/kg. Zinc was detected below the reddish-purple soils in fill deposits above the native meadow mat at SB-38 at a concentration of 19,200 mg/kg. The zinc result for this sample was below the USEPA Region 9 PRGs for residential (24,000 mg/kg) and industrial (100,000 mg/kg) settings.

Samples of the unsaturated intervals of reddish-purple soils were collected at SB-36 and SB-38 for SPLP analysis. Analytical results for the leachate of these soils collected indicated detectable concentrations of the following constituents above the lower of the NJDEP GWQC and the USEPA Region 9 Tap Water PRGs for the following metals.

- antimony
- arsenic
- cadmium
- iron
- lead
- manganese

- nickel
- Of these metals iron and lead were the two constituents with the highest measured values ranging in concentrations between 72 and 2,000 μ g/l and 710 and 2,200 μ g/l, respectively. The highest concentrations of both these metals were detected in the leachate from sample SB-36-1.7. Concentrations of arsenic were above the NJDEP GWQC (3 μ g/l) and the USEPA Region 9 Tap Water PRG (0.045 μ g/l) and ranged between 96 μ g/l (SB-38-2.5) and 140 μ g/l (SB-36-1.7). Antimony was detected in both samples above the NJDEP GWQC (6 μ g/l) and the USEPA Region 9 Tap Water PRG (14.6 μ g/l) at concentrations as high as 64 μ g/l. Cadmium, and manganese exceeded the NJDEP GWQC (cadmium 4 μ g/l, manganese 18.2 μ g/l) at concentrations as high as 140 and 88 μ g/l, respectively. Cadmium and manganese did not exceed the Region 9 Tap Water PRGs. Nickel was only detected above the NJDEP GWQC (100 μ g/l) in the leachate from sample SB-36-1.7 at a concentration of 160 μ g/l. This concentration did not exceed the USEPA Region 9 Tap Water PRG for nickel of 730 μ g/l.

SPLP data will be evaluated and discussed further in context of the soil data discussed herein as part of the fate and transport section of the RI.

Shoreline Slag Sample

The sample of the black glassy-slag found along the cut-bank of the northern shoreline at the former Lever Brothers property (SLG-01) was analyzed for TAL metals and for TAL metals using the SPLP method. Results of these analyses showed only arsenic was above the NJDEP Soil Screening Criteria and USEPA Region 9 PRGs for both residential and industrial settings. The concentration of arsenic in the slag sample was 39.5 mg/kg. All other metals as tested for in this in this sample were below NJDEP and USEPA soil criteria.

The analysis of the leachate from this sample using SPLP had detectable concentrations of aluminum, iron, and lead above the applicable NJDEP GWQC. Specifically aluminum was detected above the NJDEP GWQC (200 $\mu g/l$) in the leachate from this sample at a concentration of 960 $\mu g/l$. Iron was detected above the NJDEP GWQC (300 $\mu g/l$) at a concentration of 1,700 $\mu g/l$. Lead was detected above the NJDEP GWQC (5 $\mu g/l$) at a concentration of 17 $\mu g/l$.

Groundwater Grab Samples

Groundwater grab samples were collected from temporary wells at a total of 5 locations throughout the Block 93 North property (TWP-SB-28, TWP-SB-29, TWP-SB-30, TWP-SB-31 and TWP-SB-32). With the exception of TWP-SB-32 each groundwater grab location was collocated with a boring of a similar name (e.g. TWP-SB-38 and SB-28) where a minimum of 2 soil samples were collected (results discussed above). All groundwater grab samples were collected outside those areas where visual observations and mineralogical analyses indicated no evidence of reddish-purple soils. Temporary wells were installed within or adjacent to intervals of brown/black slag-rich fill. A summary of the groundwater analytical results are provided in Table. Arsenic results for groundwater are plotted on a Site map as Figure 3.

Concentrations of arsenic in groundwater samples collected from the temporary monitoring wells at Block 93 North ranged between $49.4 \mu g/l$ at TWP-SB-31 and 39,400 at TWP-SB-28.

In general, the results for field-filtered and non-field-filtered samples from the same well points were equal; indicating the majority of arsenic in these samples was dissolved (able to pass through a 0.45 micron mesh filter). Concentrations in all samples were above the NJDEP GWQC (3 μ g/l) and the USEPA Region 9 Tap Water criteria (0.045 μ g/l) for arsenic. Results for the sample collected at TWP-SB-28 were consistent with the four samples collected from monitoring wells immediately adjacent to this groundwater grab location (MW-111A and MW-111B) during RI activities. Data indicate that arsenic concentrations in groundwater decline significantly toward the south and east of TWP-SB-28. However, directly to the east of TWP-SB-28 arsenic concentrations remained elevated in the samples collected from TWP-SB-32 (4,250 μ g/l in the field-filtered sample and 4,450 μ g/l in the non-field-filtered sample).

These data will be evaluated and discussed further in context of the soil data discussed herein as part of the fate and transport section of the RI.

Comparison of Brown/Black Slag-Rich Fill to Reddish-Purple Soils

Visual

In general visual observations and descriptions of the reddish-purple soils and brown/black fills were consistent with prior observations and descriptions generated during RI activities and presented in the Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils (CH2M HILL, 2007b). However, more accurate and refined visual descriptions of the materials comprising both these different soils have been developed as a result of this most recent sampling event which required a more detailed inspection of soil samples as part of the sample selection process.

The following list presents the visual observations that define the differences between these two soil types and notes how observations made during this most recent sampling event have further refined the understanding of the occurrence of these materials and their visual characteristics:

- Brown/black fill is more heterogeneous (consistent with previous observations);
- Brown/black fill contains an abundance of glassy slag. Although generally in lesser amounts, slag was also observed in select intervals of reddish-purple soil;
- Cinders and ash were not present in either the brown/black fill or the reddish-purple soils;
- Brown/black fill is sometimes found in the presence of trace amounts of brick and coal;
 and
- Reddish-purple soil intervals are found exclusively within the footprint of the former acid plant; and
- Brown/black fill was also found within the footprint of the former acid plant above and below intervals of reddish-purple soils.

Mineralogical

Results of the XRD and Thin Section Petrographic analyses show a distinct mineralogical difference between the brown/black fill and the soils within the footprint of the former acid plant, specifically those that are reddish-purple in color. The presence of pyrite and jarosite indicate that the reddish-purple soils include unburned or partially burned pyrite that is continuing to oxidize. Exposure of pyrite ore to rain and moisture would results in the oxidation of this material and ultimately produces reddish iron oxide minerals and elevated concentrations of iron and the ore's metal impurities such as arsenic, lead, copper, antimony, and thallium. The oxidation reaction of pyrite (FeS₂) can be generally expressed as follows:

$$FeS_2 + 15/4O_2 + 7/2H2O \rightarrow Fe(OH)_3 + 2SO_4^2 + 4H^+$$

In the presence of molecular oxygen (O_2) that can be present in the form of rain water the Fe(II) and S_2 (-II) present as pyrite are oxidized by the O_2 resulting in ferrihydrite (Fe[OH]₃) dissolved sulfate(S[VI]) and hydrogen ions (H+). This reaction results in a strong acidic solution that releases impurities within the pyrite such as arsenic.

As the oxidation of pyrite occurs jarosite forms and conditions become acidic as a result of the oxidation of pyrite and dissolution of jarosite. In the presence of a source of calcium (calcite, dolomite, or plagioclase feldspar) some of the sulfate from the further oxidation of pyrite and dissolution of jarosite precipitates gypsum. In other words, both the oxidation of pyrite and dissolution of jarosite produces sulfuric acid that reacts with adjacent minerals forming secondary minerals. They both produce dissolved sulfate and even sulfur under highly oxidizing conditions. Iron from both minerals eventually forms the red/purple iron oxide mineral hematite. In the vicinity of the reddish-purple soils groundwater has consistently been acidic (pH between 4 and 6). The acidic groundwater as well as the presence of pyrite, jarosite, and gypsum as intergranular cements within these soils suggests that pyrite oxidation is continuously occurring in the area of these reddish-purple colored soils. This is best illustrated at location SB-36 where the XRD results from the unsaturated 'very dusky red' soils (SB-36-1.7) show that the soils are comprised of 15 percent pyrite. These high levels of pyrite as well as the presence of 14 percent sulfur, only 2 percent hematite and no jarosite suggest the presence of a raw or only partially burned ore. Within the saturated zone at the same location (SB-36-4.2) pyrite comprises only one percent of the sample as jarosite (31%) and hematite (23%) have formed as a result of the active oxidation of and overlying upgradient source of pyrite. Still deeper in sample SB-36-6.3 the reddish color of the soils grades to black and in the presence of the glassy slag-rich black fill mullite and amorphous glass dominate the composition with jarosite and gypsum comprising only 4 percent.

Previously it was hypothesized that the deposition of roasted pyrite fines (e.g. bag-house dust) during the acid plant operations may be one reason for the presence of the fine-grained reddish-purple soils (CH2M HILL, 2007b). However, the proximity of these potential wastes relative to the water table was not congruent with the fact that the groundsurface in the vicinity of these operations would have had to have been filled in above the water table prior to construction and operation of the former acid plant, thus these materials could not have been placed beneath the water table within the central area of operations. The oxidation of pyrite as rainwater infiltrates through the ore explains why

these reddish-purple soils are seen at and below the water table and explains why the pyrite and jarosite are significant components of the intergranular cements. The depiction of pyrite storage areas in the 1911 and 1930 Sanborn® Fire Insurance Maps as well as the 1958 Insurance Map of the General Chemical Plant directly in the area of these borings supports the assertion that these reddish-purple soils are not cinders, slag or ashes resulting from the roasting of pyrite but are instead the result of the oxidation of the raw pyrite ore that was once stored here and that may still be present as a thin horizon that remains directly above the water table. The stratigraphic record of soils in this area also confirms that filling occurred prior to acid plant operations as the ubiquitous, black, slag-rich fills, with brick and coal are found beneath the reddish-purple soils directly above the native meadow mat deposits.

Mineralogical signatures indicating the presence of pyrite and byproducts of the pyrite oxidation process were found exclusively in the northwest corner of the Quanta property (SB-36, SB-37, and SB-38). Elsewhere, including Block 93 North (SB-28 through SB-31), and the former Lever Brothers property both in the vicinity of MW-107 monitoring well series (SB-34C) and the slag within the fill along the northern shoreline (SLG-01) the mineralogy is defined by the presence of glass and mullite-rich slag with hematite as a the primary intergranular cement.

Chemical

In order to evaluate whether there is a qualitative difference between these two materials with respect to their chemical composition, a review was performed of the available analytical data for those locations where boring logs have mentioned the presence of ash, cinders, or reddish-purple soils. This evaluation was originally prepared and submitted to the Agencies as part of the Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils (CH2M HILL, 2007b). This evaluation has been updated with the results from the June 2007 drilling and soil sampling event. An updated summary of all soil borings where these conditions were observed and a summary of the soil sampling performed is provided in Table 7.

To date, brown/black fills have been observed at a total of 118 locations across the five properties surrounding the Quanta property. A total of 70 samples of this material (not including those found within areas of reddish-purple soils) have been analyzed for metals. Reddish-purple soils have been found exclusively within the footprint of the former acid plant at a total of 17 locations in the southwestern portion of the former Celotex property and the northwestern portion of the Quanta property. A total of 12 samples of these materials have been collected for the analysis of metals as part of RI activities as well as sampling performed by other consultants at adjacent properties. The range of, and geometric mean concentrations for these two data sets are shown for each of these soil types in Table 8.

In general, observations and analytical data collected during this investigation were consistent with the existing data set collected during RI activities and presented in the Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils (CH2M HILL, 2007b). Comparison graphs showing the high, low and geometric mean concentrations of select metals concentrations in reddish-purple soils and brown/black fills reported to contain slag, cinder, ash or coal found outside

the historically mapped footprint of the former acid plant collected prior to the June 2007 and those collected during the most recent sampling event are included in Appendix D as Figures D-1 through D-5. These graphs show that concentrations of key metals (antimony, arsenic, copper, iron, and lead) in brown/black fills and the reddish-purple soils were consistent with existing data sets for each of these different soils. In some cases the brown/black fill samples showed slightly higher concentrations than what had previously been observed. This is likely a result of the fact that during this sampling event sampled intervals were specifically selected to exclude soils that did not contain the materials thought to be the cause of these elevated metals (e.g. slag), thus these sample results were likely biased high relative to the existing data set where sample selection had often focused on quantifying other impacts such as coal tar.

Consistent with previous sampling results geometric mean concentrations of antimony, arsenic, barium, copper, iron, lead, and thallium for the 5 samples collected within the reddish-purple soil intervals were at least one order of magnitude greater than the geometric mean concentrations for the other 9 samples that were collected from brown/black fill deposits outside the historically mapped footprint of the former acid plant as part of this work (see Tables 6 and 8). Additionally, the geometric mean concentrations of these metals, were all above the lowest of the industrial and residential NJDEP Soil Cleanup Criteria and USEPA Region 9 PRGs. This was not the case for the samples collected from the black/brown fills collected outside the area of reddish-purple soils. Concentrations of these metals were significantly lower and although antimony, arsenic, copper, iron and lead exceeded the lowest soil screening criterion in select samples, only the geometric mean concentration of arsenic in these samples was in excess of the industrial and residential NJDEP Soil Cleanup Criteria and USEPA Region 9 PRGs.

These results again confirm that the pyrite oxidation-impacted soils have distinctly elevated concentrations of the metals mentioned above, that distinguish them from the other slagrich brown/black fill deposits across the 5 properties. It should also be noted that the geometric mean and range of concentrations in brown/black fill containing slag are consistent with the minimum, maximum concentrations published in the NJDEP Historic Fill Database [Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005)]. Conversely, the maximum and geometric mean concentrations of arsenic in pyrite oxidation-impacted soil samples are 5,870 mg/kg and 1,385 mg/kg, respectively, and are well above the maximum and average concentrations reported in the NJDEP Historic Fill Database for this constituent. This is also the case for lead where the maximum and geometric mean concentrations in pyrite oxidation-impacted soil samples are 38,800 mg/kg and 3,020 mg/kg, respectively, and the maximum and average concentrations in the NJDEP Historic Fill Database are 10,700 mg/kg and 574 mg/kg, respectively.

A detailed statistical evaluation of the differences between concentrations of the reddish-purple soils and those detected in the brown/black slag-rich fills was conducted for the five properties as part of the Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils (CH2M HILL, 2007b). Specifically, the differences in mean concentrations between the two groups were evaluated statistically using means tests (parametric or non-parametric). The decision to use a parametric or non-parametric test was made by checking for normality using a Shapiro-

Wilks test and homogeneity of variance (F-value). If both datasets were normal and had homogenous variances, then a parametric test (simple t-test) was performed. Otherwise, a non-parametric Mann-Whitney U test was performed. Data were log transformed to achieve normality, if possible. For the purpose of these calculation non-detects were assumed to be one-half the detection limit.

Results from this evaluation confirmed that there is a distinct statistical difference between the reddish-purple soils and all back/brown slag-rich fills with respect to certain metals including antimony, arsenic, copper, iron, lead and thallium. Due to the obvious similarities in data sets (see Appendix D) this evaluation was not updated as part of this report. The results of these statistical evaluations are included again herein as Table 8.

Summary and Conclusions

- Consistent with earlier data reported and discussed in the Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite Impacted Soils Technical Memorandum (CH2M HILL, 2007b) visual observations and chemical analysis both indicate that there are distinct differences between the reddish-purple soils and the brown/black slag-rich fill. Observations and chemical data from this most recent event provide strong confirmation of these differences. In addition, the results of mineralogical analyses (XRD and Thin Section Petrography) not previously performed on soil samples from the Site indicated the presence of pyrite and pyrite oxidation-related minerals (e.g. jarosite, gypsum and hematite) within and adjacent to the reddish-purple soils that were not seen anywhere outside the footprint of the former acid plant. These distinct mineralogical differences provide an additional line-of-evidence that the reddish-purple soils are distinctly different than the ubiquitous black-brown slag-rich fills that dominate the shallow subsurface across all the properties in the vicinity of the Site. Recent data indicate that the horizons of reddish-purple soils within the footprint of the former acid plant are the result of the ongoing oxidation of unburned or partially burned pyrite ore that likely remains present directly above the water table as a thin horizon that comprises the top portion of the observed reddishpurple soil intervals. The extent of the pyrite oxidation impacts in soil have been defined and previously presented to the Agencies. A map showing the extent of these impacts is included herein as Figure 4.
- Fill observed across all properties including along the eroding shoreline in the northern portion of the former Lever Brothers property was shown during this event to be comprised of significant quantities of black, glassy, iron-rich slag that extended to the top of native deposits. This material did not have evidence of ongoing pyrite oxidation both in its color or mineralogy. The proximity of this material directly above the native marsh deposits confirms that it was introduced prior to the development of industry in this area (including the former acid plant) and that it likely extends throughout significant portions of this area of Edgewater, New Jersey. Furthermore, observations, data, and history of the area as presented herein as well as in the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite Impacted Soils Technical Memorandum (CH2M HILL, 2007b) support the prior assertion that the brown/black slag-rich fills are not a result of historical operations related to the Site but

are Historic Fill as defined by N.J.A.C 7:26-1.8E. Consistent with these data the NJDEP Land Use Management Division and the New Jersey Geologic Survey have also mapped the Site and surrounding areas as Historic Fill as part of the requirements set forth in the "Brownfield and Contaminated Site Remediation Act" (N.J.S.A 58:10B-1 et seq.) (NJDEP,2004). Pursuant to N.J.A.C 7:26-4.6(b)2i the NJDEP's mapping of Historic Fill is provided in Figure 5 to demonstrate the ubiquity of Historic Fill within the area.

Soil sampling results indicate that although these ubiquitous slag-rich fills contain lower levels of arsenic and other metals than soils affected by pyrite oxidation, they do contain concentrations of these metals above the NJDEP Soil Cleanup Criteria and UESPA Region 9 PRGs. The concentrations or arsenic measured within the Historic Fill at the Site fall within the minimum and maximum concentrations published in the NJDEP Historic Fill Database [Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005)]. In accordance with Section 4.6(b)2iii of the New Jersey Technical Requirements for Site Remediation Historic Fills do not require examination beyond the extents of Site. Considering that the only source of arsenic outside the defined pyrite oxidation area has been shown to be the brown/black slag-rich Historic Fill and this material is not required to be delineated outside the Site boundaries per N.J.A.C 7:26-4.6(b)2iii, delineation of arsenic in soil at the Site is considered complete. The presence of metals (including arsenic) and PAHs with the boundaries of the Site that have resulted from the presence of Historic Fill will be addressed as part of the remedy selection process and discussed further in the Feasibility Study Report.

References

CH2M HILL. 2007a. Remedial Investigation/ Feasibility Study Work Plan Addendum No. 3 and Field Sampling Plan for the Characterization of Cinder/Ash and Reddish-Purple Soils, Quanta Resources Superfund Site OU1, Edgewater, New Jersey. April.

CH2M HILL. 2007b. Draft Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils, Quanta Resources Superfund Site OU1, Edgewater, New Jersey. February.

CH2M HILL. 2007c. Proposed Scope of Work – Supplemental Data Gap Sampling (RI Work Plan Addendum No. 2), Quanta Resources Superfund Site OU1, Edgewater, New Jersey. March.

CH2M HILL. 2006. Draft Preliminary Site Characterization Report, Operable Unit 1, Quanta Resources Superfund Site, Edgewater, New Jersey. February.

Dan Raviv Associates, Inc. 2002. Final Soil RI Report, Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey. July.

GZA GeoEnvironmental, Inc. 2007. Supplemental remedial Investigation Report, iPark Edgewater, 45 River Road, Edgewater, New Jersey, ISRA Case #E20040267. March.

New Jersey Administrative Code. 1997. Technical Requirements for OU1 Remediation. Section 7:26E. (Amended July 2005.)

TRC Raviv Associates, Inc. 2004. Ground Water Remedial Investigation Report, Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey. July.

Table 1 Summary of Soil Sampling
Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling Quanta Resources Superfund Site, OU1 Edgewater, New Jersey

	Completed Boring ID	Cinder/Ash and Reddish-Purple Soils	Original Supplemental Data Gap	Sample ID	Sample Date	Sample Time	Position Relative to	Sample Depth (ft	¹ Targeted Materails Visually			² Laboratory A	nalytica	I Samples			Data Quality Objectives (DQO)
	Donning ID	Characterization Location ID	Sampling Location ID		1.204		Water Table	bgs)	Observed in Sample	voc	svoc	³ Petrographic	XRD	TAL Metals	тос	SPLP- TAL Metals	
				SB-28-3.4-060507	6/5/2007	10:05	Unsaturated	2.9 - 3.9	Slag			×	x	x	х	x	Characterize mineralogy and concentrations of TAL metals in cinderlash materials on Block 93 North where concentrations approximately 50 milligrams per liter (mg/l) of arsenic have been observed in groundwater and 0.5 feet of documented black cinderlash and slag (MW-111A 69) have not been sampled to date; and 2.) Evaluate cinderlash containing fill deposits in the of monitoring wells MW-111A and MW-111B as a potential source for arrestic impacts to groundwater. 3.) To define the extent of arsenic in shallow soils (0-4 feet bgs) on the Block 93 North property.
	SB-28	SB-28	SB-28	SB-28-6.3-060507	6/5/2007	9:40	Saturated	5.6 - 7.0	Slag		x	x	x	х	×		1.) Characterize mineralogy and concentrations of TAL metals in cinder/ash materials on Block 93 North where concentrations approximately 50 milligrams per liter (mpl) of ansenic have been observed in groundwater and 0.5 feet of documented black incider/ash and saig (MW-1114.86) have not been sampled to date, and 2.) Evaluate cinder/ash containing fill deposits in the of monitoring wells MW-111A and MW-111B as a potential source for arrancic impacts to groundwater. 3.) To define the extent of naphthaten and beraco(a) pyrene in saturated soils (below 4 feet bgs) along the western border of to Block 93 North property. 4.) To define the extent of arrancin contained to the saturated soils (below 4 feet bgs) on the Block 93 North property.
Hook 02		141 113	10.0	SB-29-1.9-060507	6/5/2007	12:30	Unsaturated	0.8 - 2.9	none			Х	X	X			1.) To define the extent of arsenic in shallow soils (0-4 feet bgs) on the Block 93 North property
North	SB-29	N/A	N/A	SB-29-6.7-060507	6/5/2007	12:25	Saturated	5.0 - 8.4	none		Х	×	X	x	114		 To define the extent of naphthalene and benzo(a)pyrene in saturated soits (below 4 feet bgs) along the western border of th Block 93 North property. To define the extent of arsenic in saturated soits (below 4 feet bgs) on the Block 93 North property.
	SB-30	SB-32	SB-32	SB-30-2.5-060507	6/5/2007	14:00	Unsaturated	1.5 - 3.5	none	x	x	×	x	x	x	x	1.) Characterize mineralogy and concentrations of TAL metals in cinderlash materials on Block 93 North where concentrations arsenic of 124 miligrams per kilogram (mg/kg) have been observed in soil and black cinderlash and slag have been document this area in thicknesses of approximately 10 feet (58-26); and 2.) Evaluate these cinderlash containing fill deposits as a potent source for arsenic impacts to groundwater. 3.) To define the extent of benzo(a)pyrene and benzene in shallow soils (0-4 feet bgs) along the western border of the Block 9; property. 4.) To define the extent of arsenic in shallow soils (0-4 feet bgs) on the Block 90 have property.
				SB-30-9.5-060507	6/5/2007	14:10	Saturated	4.0 - 15.0	Slag			x	X	x	x		1.) Characteriza minaralogy and concentrations of TAL metals in cinderfash materials on Block 93 North where concentrations arsenic of 124 milligrams per kilogram (mg/kg) have been observed in soil and black cinderfash and slag have been document fils area in tricknesses of approximately 10 teet (58-28); and 2.) Evaluate these cinderfash containing fill deposits as a potent source for arsenic impacts to groundwater. 3.) To define the extent of arsenic in saturated soils (below 4 feet bgs) on the Block 93 North property
		2.5		SB-31-1.1-060507	6/5/2007	13:30	Unsaturated	0.0 - 2.2	Slag			X	X	X	×	X	1.) Characterize mineralogy and concentrations of TAL metals in cinder/ash materials on Block 93 North where elevated
	SB-31	SB-34	N/A	SB-31-6.0-060507	6/5/2007	14:05	Saturated	4.5 - 7.6	Slag	- I		x	X	х	х		concentrations of arsenic have been observed in soil (specifically, 913 mg/kg detacted at historical boring S8-13) and black cinder/lash and slag have been documented in this area in thicknesses of approximately 5 feet (S8-13); and 2.) Evaluate these cinder/lash containing till deposits as a potential source for arsenic impacts to groundwater.
	ATT WIT	Aut Hall I		SB-34-1.3-060407	6/4/2007	14:00	Unsaturated	0.9 - 1.6	Slag		To a second	x	X	X	х	x	and the state of t
Former Lever	SB-34	SB-35	N/A	Not Collected - Ob Sample	estructions Pr	revented	Saturated	_	-					-		-	1.) Characterize mineralogy and concentrations of TAL metals in circler/ash materials on the former Lever Bros. property when concentrations of approximately 15 mg/l of arsenic have been observed in groundwater and 0.75 feet of documented black cin and slag (NW1-122A) have not been sampled to date, and 2.) Evaluate cinder/ash containing fill deposits in the vicinity of more
Brothers		94.014.		Not Collected - Ta		rials Not	Unsaturated		None								wells MW-107, MW-107A, and MW-122A as a potential source for arsenic impacts to groundwater.
	SB-35	SB-36	N/A	Not Collected - Ta	served argeted Mater served	rials Not	Saturated	-	None								1.) Characterize mineralogy and concentrations of TAL metals in cinderlash materials on the former Lever Bros, property wher concentrations of arsenic of 66 milligrams per kilogram (mg/kg) have been observed in soil and black cinderlash and stag have documented in this area in thicknesses of approximately 10 feet (SB-25); and 2.) Evaluate these cinderlash containing fill depo- la potential source for arsenic impacts to groundwater.
400				SB-36-1.0-060607	6/6/2007	14:15	Unsaturated	0.8 - 1.2	None			X	Х	X	X		a potential source or arseric impacts to groundwater.
100	SB-36	SB-37	N/A	SB-36-1.7-060607	6/6/2007	14:30	Unsaturated	1.2 - 2.2	Reddish- Purple Soils Reddish-			X	X	х	х	Х	Characterize mineralogy and concentrations of TAL metals in reddish-purple soils at the Quanta Resources property where
	96.			SB-36-4.2-060607	6/6/2007	15:10	Saturated	3.2 - 5.2	Purple Soils			X	×	X	X		elevated concentrations of arsenic have been observed (specifically, 3,900 mg/kg detected at historical Dan Raviv boring B-18 Confirm Dan Raviv Associates arsenic soil results; 3.) Evaluate these impacted materials as a potential source for arsenic imp
			-		6/6/2007	15:25	Saturated	5.9 - 6.7	Coal & Slag			X	X	X	X		groundwater.
Quanta	Total Control	× ×	1 5	Not Collected - Ta Obs	rgeted Mater served	nais Not	Unsaturated		None				1				
esources	SB-37	SB-38	N/A	SB-37-4.5-060607	6/6/2007	12:20	Saturated	3.9 - 5.0	Reddish- Purple Soils & Slag	W- = 3	1	x	x	x	x	7/3	1.) Characterize mineralogy and concentrations of TAL metals in reddish-purple soils at the Quanta Resources properly where elevated concentrations of arrestic have been observed (specifically, 12,000 mg/kg detected at historical Dan Raviv boring B-17 Confirm Dan Raviv Associates arsenic soil results; 3.) Evaluate these impacted materials as a potential source for americ imparoundwater.
			7	SB-38-2.5-060607	6/6/2007	10:00	Unsaturated	1.7 - 3.4	Reddish-			X	X	X	X	X	
8 1	SB-38	SB-39	N/A	SB-38-5.4-060607	6/6/2007	10:55	Saturated	3.4 - 7.3	Purple Soils Reddish- Purple Soils			x	х	x	X		 Characterize mineralogy and concentrations of TAL metals in reddish-purple soils at the Quanta Resources property where elevated concentrations of arsenic have been observed (specifically, 38,100 mg/kg detected at historical Dan Raviv boring 8-11
			The state of	SB-38-9.5-060607	6/6/2007	10:30	Saturated	9.4 - 9.6	None None			X	X	X	X		Confirm Dan Raviv Associates arsenic soil results; 3.) Evaluate these impacted materials as a potential source for arsenic impagroundwater.
	urface Grab Sample	N/A	N/A	SLG-01-060407	6/4/2007	16:20	Unsaturated	0.0 - 0.2	Slag			x	x	х	x	х	A). Charactetze mineralogy, leachability, and concentrations of TAL metals in stag found eroding from the shoreline at the north portion of the former Lever Bros. property.

Notes:

1. Samples where slag was not visually observed were later found to contain significant quantities of black glassy slag through X-ray Diffraction and Thin Section Petrography analyses.

2. Specific Laboratory Analytical methods and analyte lists are provided in the revised Quality Assurance Project Plan (QAPP) (CH2M Hill, July, 2006)

3. Samples contained for Thin Section Petrography were collected as a homogenized composite of the target interval with the exception of three samples from SB-36 (0.8-1.2 ft. bgs., 1.2-2.2 ft. bgs., and 3.2-5.2 ft. bg) where the cohesiveness of the soils allowed for sampling of a 3-inch intact interval of the soil core, VOCs: volatile organic compounds Analytical Methods:

SVOCs: semi-locatile compounds

Petrography: Thin Section Petrography (a transmitted light, optical microscopy descriptive technique that characterizes the mineralogy as a function of sediment texture and fabric.

XRD, X-ray Diffraction (specifically a mineralogical evaluation involving the isolation of the day fraction, and "whole rock" analysis)

TOC: Total Organic Carbon.

TAL: Target Analysis Metals

SPLP: synthetic precipitation leachate procedure.

Dista Quality Objectives Initiate in the Remedial Investigation/ Feasibility Study Work Plan Addendum No. 3 and Field Sampling Plan for the Characterization of Cinder/Ash and Reddish-Purple Soils (CH2M Hill, April 20, 2007)

Table 2 Summary of Groundwater Sampling Jono's Restaurant Vapor Intrusion Evaluation & Supplemental RI Sampling Quanta Resources Superfund Site, OU1

TWP-SB31

DUP-060607-GW-F

Edgewater, New Jersey

<u></u>	Screened						¹ Labor	atory Analytica	I Samples	
Temporary Well ID	Interval (ft. below ground surface)	Sample ID	Field- Filtered	Depth Interval	Sample Date	Sample Time	³ VOCs & SVOCs	Total Arsenic	Dissolved Arsenic	² Data Quality Objective (DQO)
TWP-SB28	8 - 9	TWP-SB28-060507		8.0 - 9.0	6/5/2007	10:45	. X	Х		
TVII ODZO	0-9	TWP-SB28-060507-F	Х	0.0 - 9.0	6/5/2007	10.45			X	
TWP-SB29	7.5 - 8.5	TWP-SB29-060607		7.5 - 8.5	6/6/2007	11:45	Х	X		
1771 OB20	7.0 - 0.0	TWP-SB29-060607-F	Х	7.5 - 6.5	, 6/6/2007	11.45			Х	,
TWP-SB30	8 - 9	TWP-SB30÷060507		8.0 - 9.0	6/5/2007	14:10	Х	Х		1.) To define extent of arsenic in groundwater
	1 0-9	TWP-SB30-060507-F	Х	0.0 - 9.0	6/5/2007	14.10			X	surrounding the MW-111 series
TWP-SB31	7.5 - 8.5	TWP-SB31-060607		7.5 - 8.5	6/6/2007	4.4.20	Х	X		
1771 -0001	7.5 - 0.5	TWP-SB31-060607-F	Х	7.5 - 6.5	0/0/2007	14:20			X	
TWP-SB32	6.5 - 7.5	TWP-SB32-060607		6.5 - 7.5	6/6/2007	9:50	Х	. X		
	0.5 - 7.5	TWP-SB32-060607-F	Х	0.5 - 7.5	6/6/2007	9.50			X	
TWP-SB33	5 - 6	TWP-SB33-060407		5.0 - 6.0	6/4/2007	16:10	×			·
		QA/QC Samples								· · · · · · · · · · · · · · · · · · ·
		EB-060407-GW			6/4/2007	18:20	Х			
		EB-060507-GW			6/5/2007	17:55	Х	Х		· .
		EB-060607-GW			6/6/2007	17:40	Х	Х		•
		DUP-060607-GW		75 05	6/6/2007	44.20	Х	Х		
	TMP_9831	DUD DEDECT CW F		7.5 - 8.5	.6/6/2007	14:20				

Notes:

^{1.} Specific Laboratory Analytical methods and analyte lists are provided in the revised Quality Assurance Project Plan (QAPP) (CH2M Hill, November, 2006)

^{2.} Data Quality Objectives presented above represent those presented in the Proposed Scope of Work – Supplemental Data Gap Sampling (CH2M Hill, March 22, 2007) (Remedial Investigation Work Plan

^{3.} Groundwater samples analyzed for VOC: volatile organic compounds, SVOC: semi-volatile organic compounds were part of the Jono's Vapor Intrusion Evaluation. The Data Quality Objective for these samples was to evaluate the potential for vapor intrusion into the Jono's Restaurant building of previously detected VOCs and SVOCs in soil and groundwater on the Block 93 North property. These data will be presented and discussed under separate cover and are not the focus of this technical memorandum.

Table 3 Summary of Field Parameters for Groundwater Jono's Restaurant Vapor Intrusion Evaluation & Supplemental RI Sampling Quanta Resources Site, OU1

Edgewater, New Jersey

Well ID	Property [°]	pН	Temp. (° C)	Cond. (mS/cm)	ORP (mV)	DO (mg/L)	LaMotte Turb. (NTU)	Comments
TWP-SB28	Block 93 North	6.69	21.67	0.033	-150.1	0.99	38.7	Clear/None
TWP-SB29	Block 93 North	6.67	18.31	6.819	-171.9	1.07	13	Clear/None
TWP-SB30	Block 93 North	6.83	17.89	0.018	-180.8	0.17	116	Clear/None
TWP-SB31	Block 93 North	7.25	15.09	0.43	-182	4.02	19	Clear/None
TWP-SB32	Block 93 North	7.13	15.81	1.604	-180.8	2	17.3	Clear/None
TWP-SB33	Block 93 North	8.02	18.96	1.212	120.7	1.95	12	Clear/None

Notes:

All sampling conducted per sampling plan Parameters measured with YSI-556 water quality meter. Measurement Units:

mL/min - milliliters per minute mS/cm - milliSiemens per centimeter

NTU - Nephelometric turbidity unit

mV - millivolt

Table 4
Summary of X-Ray Diffraction Results
Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling
Quanta Resources Site, OU1
Edgewater, New Jersey

	Sample Field Identification:	\$B-28-3.4- 060507	SB-28-6.3- 060507	SB-29-1.9- 060507	∕SB-29-6.7- 060507	SB-30-2.5- 060507	SB-30-9.5- 060507	SB-31-1.1- 060507	SB-31-6.0- 060507	SB-34C-1.3- 060407
	Sample Lab Identification:	27291-02	27291-03	27291-04	27291-14	27291-07	27291-08	27291-05	27291-06	27291-01
MINERAL CONSTITUENTS	CHEMICAL FORMULA	<u>black</u> , loose/ medium dense, dry, fine angular GRAVEL, little <u>CINDER/</u> <u>SLAG</u>	<u>biack</u> , dense, saturated fine angular GRAVEL and coarse SAND, trace silt, trace <u>CINDER/ SLAG</u>	<u>verv dark brown, some</u> <u>reddish-black,</u> densa, dry, sandy silt, trace small angular gravel	black and red_loose, moist to saturated, fine to medium GRAVEL, some brick	dark grey, medium dense, moist, very fine SAND and GRAVEL	dark grey, moist, fine GRAVEL and coarse SAND, some medium sand, little silt, trace SLAG	yery dark brown, medium dense, dry fine silly sand and coerse engular gravel	black, loose, saturated, GRAVEL, little <u>CINDER/ SLAG</u> , some soft plastic tar	brown, medium dense moist, crushed BRICK, GRAVEL, SILT and SAND, trace <u>CINDER</u> , SLAG
Quartz	SIO 2	11	21	. 5	14	10	10	14	19	9
Cristobalite	SIO:			1						
Plagioclase Feldspar	(Na,Ca)AISI , O ,	3	22	trc	3	17	19	22	8	tro
K-Feldspar	icaisi, o,	1	5	1	. 2	3	7	2	3	
Catcite	CaCO,	1	11	trc	1	4	6		trc	
Dolomite	(Ca,Mg)CO ;									
Siderite	FeCO;			7						
Halite	- NaCl									1
Gypsum	CaSO 4 . 2H 2 O		trc			trc	1	trc		trc
Hornblende	Ca ₂ (Mg,Fe) ₅ (SI,AI) ₆ O ₂₂ (OH) ₆	trc			trc	1	trc	1	trc	
Augite	Ca(Fe,Mg)Si 2 O 4	2	4		· · · · · · · · · · · · · · · · · · ·	7	10	12	1	
Sulfur	S									
Mullite	AI , SI , O , ,	13	5	19	4	12	11	3	10	24
Magnetite	aipha-Fe,O,	<u>8</u>	8	5	- 38	5		7	9	5
Hematite	alpha-Fe ₂ O ₂		2		2	1	trc		. 2	
Goethite	alpha-FeOOH	8		4						
Akaganeite	beta-FeOOH			11				· · · · · · · · · · · · · · · · · · ·		
Pyrite	FeS									
Jarosite	KFe ₃ (\$O ₄) ₂ (OH) ₈									
Kaolinite	Al ₂ Sl ₂ O ₅ (OH) ₄	trc		trc	trc	1	trc	. tro	trc	
Chlorite	(Mg,Al) _e (SI,Al) ₄ O ₁₀ (OH) _e	trc				trc	1			
Illite / Mica	KAI 2 (SI 3 AIO 10)(OH) 2	11	1	1	1	1	1	-3	2	trc
Mixed-Layered Illite/Smectite	K _{0.5} Al ₂ (SI,Al) ₄ O ₁₀ (OH) ₂ .2H ₂ O	2	11	1	tre	3	4	1	1	1
Amorphous		<u>50</u>	30	<u>55</u>	35	35	30	35	45	60
	TOTAL	100	100	100	100	100	100	100	100	100

Notes: trc: trace all results reported in percent (%)

tro: trace all results reported in percent (%)

100	100	100	100	100	100	100	100	001	<u> </u>	lotes;
		007			007	007	001	100	TATO1	<u> </u>
23	40	12	01	50	09	20	50	99		Amorphous
ı	2	ŀ	onf		ont	7	ŀ	ŀ	K 0 \$ A1 2 (SI, AI) 40 10 (OH) 2 . 2H 2 O	Mixed-Layered (1)lite/Smectite
ı				k	ont	ı	211	į.	KAI 2 (SI 3 AIO 10) (0H) 2	Illite / Mica
								, 21)	, (HO) o, (IA, I2) , (IA, BM)	Chlorite
								on)	, (HO) 3 O 1 IZ 1 IA	Kaolinite
	ı	7	ont	l .	ŀ	31	5-	. 8	«КFе₃(SO₄); (ОН).	stisonst
				7			15		, SeA	Pyrite
								,	HOO9-1-619-d	Akaganeite
									H00e7-enqle	Goethite
		LL	. }/	P S	S	53	2	ı	c O s e Radqia	Hematite
9			L				01		, O _e e H- and la	Magnetite
61	9	2	7	8	81				ti O, IZ, IA	- AlilluM
							Þļ		ş	Sulfur
·					*			·	Ce(Fe,Mg)Si 2 O e	əifpuA
					ont .			 	C= 1 (MQ,F=) 1 (SI,AI) 1 O 12 (OH) 1	Hornblende
	22	out	7	l .	3	3	8		C#2O*'5H [‡] O	Gypsum
		2		, i					NaCi	ətilsH
	50				ort	5			Feco,	Siderite
							S		Ca(Mg)CO 3	Dolomite
	-								°oses	Calcite
						out-			Katst to t	K-Feldspar
	<u> </u>		ont			<u> </u>	9	9	(Na,Ca)AlSI 10 a	Plagioclase Feldspar
	<u></u>		· L						z ois	Cristobalite
	<u> </u>	11	S	SI.	01	91		72	ois	zheuQ
enshed surface SLAG (Hudson River Shoreline, River Shorel Alover Bros.)	black, loose, salurated, angular GRAVEL, trace fine sand, coal tar	dank red, loose, salureled, coerse SAVD end GARVEL, frace siif, coel ter	mword-fizibben eaneb muibem Molal, film SADD, little coerse sent leverg bne	Yery dusky red . Hoose, satureted, medium SAND, little Yery dusky red .	black, loose, saturated, fine SAVD, little coal? gravel, coarse sand, brick and CINDER!	dusky red., loose, saturated, fine SAND, frace coarse sand, frace gravel, frace sik, mottled w/ pale yellow	Yery dusk red, dense, 'dry, line SAND, inclusion of pale yellow, gravel, linclusion of pale yellow, line to coerse crystels (sulfur?)]	vib .esooi , الالف الله SAND, اللالف sinemgeni leoc الالالموات	CHEMICAL FORMULA	MINERAL
27291-15	81-16272	71-16272	91-16272	27291-09	27291-13	27-19272	11-16272	01-16272	Sample Lab Identification:	
20¢090 -0-10-57S	-5.6-8E-B2	-⊅.8.5-82 703030	-8-2-82-82 060607	-8.4-7£-82 703030	-£.8-8£-82 708080	-2.4-3E-82 703030	-7.1-ae-ae	-0.1-36-82 703030	Sample Field Identification:	

Table 4
Summary of X-Ray Diffraction Results
Summary of X-Ray Diffraction Results
Characterization of Cindenf Ash and Reddish-Purple Soils & Supplements
Gagewater, New Jersey
Edgewater, New Jersey

Table 5A

Summary of Soil Sampling Results - Metals
Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

		1	Location:	SB-28	SB-28	SB-29	SB-29	SB-29	SB-30	SB-30	SB-31	SB-31	SB-34	SB-36	SB-36
		1	Field Sample ID:	SB-28-3.4-060507	SB-28-6.3-060507	SB-29-1.9-060507	DUP-060507	, SB-29-6.7-060507	SB-30-2.5-060507	SB-30-9.5-060507	SB-31-1.1-060507	SB-31-6.0-060507	SB-34C-1.3-060407	SB-36-1.0-060607	SB-36-1,7-060607
		1	Date:	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/5/2007	6/4/2007	6/6/2007	6/6/2007
		1	Start Depth:	2.9	5.6	0.8	0.8	5	1.5	4	0	4.5	0.9	0.8	
		1	End Depth:	3.9	7	2.9	2.9	8.4	3.5	15	2.2	7.6	1.6	1.2	1.2
		1	Depth Units:	. ft	ft	ft	ft	ft	ft	ft	ft	ft	1.0	4	2.2
Parameter	Parameter Code	Units										''		10	
ALUMINUM	7429-90-5	mg/kg		5640 J	6890	3080	3650	3210	18300	7380	7090	3750	4340	1390	6670
ANTIMONY	7440-36-0	mg/kg		1.5 J	9.0	13.6	8.4	15.8	1.3 U	1.0 U	4.0	2.5 U	2.2 U	188	25.8
ARSENIC	7440-38-2	mg/kg		988	560	322	313	926	16.2	113	162	54.7	; 34.4	124	648
BARIUM	7440-39-3	mg/kg	SW6010	53	70.4	572	584	95.6	66.4	39.2	115	37	23,5	95	322
BERYLLIUM	7440-41-7	mg/kg	SW6010	0.3 J	0.4 J	0.3 __ J	0.3 J	0.2 . U	0.2 U	0.3 U	0.3 J	0.2 U	0.4	0.1 U	
CADMIUM	7440-43-9	mg/kg	SW6010	. 0.9	2.3	2.1	1.8	0.8	0.4 J	0.2 U	0.9	0.2	0.4 J	0.6	1.1
CALCIUM	7440-70-2	mg/kg	SW6010	30200	7910	6530	7820	5590	62400	15300	12500	5420	7250	5010	31400
CHROMIUM	7440-47-3	mg/kg	SW6010	10.9	,22.8	20.7	24.9	10.7	36	21.5	17.9	9.1	9.0	7.7	51.0
COBALT	7440-48-4	mg/kg	SW6010	8.8	22.3	8.0	7,3	4.3 J	8.6	7.5	32.4	5.5 J	3.3 J	1.9 J	
COPPER	7440-50-8	mg/kg	SW6010	56.4 J	372.0	657.0	490	102	132	36.1	93.1	37.8	25.0		12.2
IRON	7439-89-6	mg/kg	SW6010	15900 J	83900	39800	34800	13100	14300	11900	54300	10200	12200	111.0 36500	566.0
LEAD	7439-92-1	mg/kg	SW6010	47.1	12200	1050	814	168	88,4	30.5	132.0	60.2	30.7		81100
MAGNESIUM	7439-95-4	mg/kg	SW6010	1780 J	1410	745	912	735	5560	2720	2480	1510	1310	11400	2640
MANGANESE	7439-96-5	mg/kg	SW6010	202	217	79.9	112	97.9	142	83.8 -	454	83.4	200	554.0	272
NICKEL	7440-02-0	mg/kg	SW6010 *	13.6	33	13.7	15.2	7.6	18,9	17.8	50,3	12.9	7.6	46.8 4.7	125
POTASSIUM	7440-09-7	mg/kg	SW6010	654 J	1040 J	599 J	637 J	457 J	1090	478 J	. 856 J	368 .1	: 446 J	2380	58.9
SELENIUM	7782-49-2	mg/kg	SW6010	2.5 U	5.5	2.4	1.5 J	2.5 U	2.0 U	2.2 U	0.9 J	2.5 U			941
SILVER	7440-22-4	mg/kg	SW6010	0,2 . U	1.6	3.5	2.5	0.5 U	0.2 U	1.1 0	0.5 U	1.2 U		0.1	9.0
SODIUM	7440-23-5	mg/kg	SW6010	332 UJ	309 ·U	229 U	252 U	423 U	2320	818 J	566 J	290 U		1.8	3.7
THALLIUM	7440-28-0	mg/kg	SW6010 .	1.0 J	1.2 U	1.0 J	1.1 U	1.0 · U	1.0 U	1.1	11 11	1.2 U	7,00	1120	469
VANADIUM	7440-62-2	mg/kg	SW6010 .	9.9	19.2	20.2	21.2	12.7	50.9	22.5	52.0	16.9	7,1	1.0 U	1.2
ZINC	7440-66-6	mg/kg	SW6010	165	669	716	633	215	108	58.4	231	74.2	14.3	19.7	30,3
MERCURY	7439-97-6	mg/kg	SW7471 -	13.2	3.2	2.4	2.4	0.7	0.2	0.2	0.9	0.3	67.4	41.6	. 170
MERCURY	7439-97-6	mg/kg	SW7470								0.3	U.3	0.04 U	3.2	13.6
TOTAL ORGANIC CARBON	TOC	mg/kg	SW9060	305000	300000				47500	80600	145000	204000	147000	481000	67900

Notes:
J: Indicates the concentration was estimated

U: Indicates the parameter was not detected at or above the method reporting limit shown

Table 5A
Summary of Soil Sampling Results - Metals
Characterization of Cinderl Ash and Reddish-Purple Soils & Supplemental RI Sam
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

			Location:	\$B-36	\$B-36	SB-37	SB-38	SB-38	SB-38	SLG-01	Equip Blank	Equip Blank	Equip Blank
	ĺ	l	Field Sample ID:	SB-36-4.2-060607	\$B-36-6.3-060607	SB-37-4.5-060607	SB-38-2.5-060607	SB-38-5.4-060607	SB-38-9.5-060607	SLG-01-0.1-060407	EB-060407-S	EB-060507-S	EB-060607-S
	j	1	Date:	6/6/2007	6/6/2007	6/6/2007	6/6/2007	6/6/2007	6/6/2007	6/4/2007	6/4/2007	6/5/2007	6/6/2007
		1	Start Depth:	3.2	5.9	3.9	1.7	3.4	9.4	0	,		
		1	End Depth:	5.2	6.7	5	3.4	7.3	9.6	0.2			
		1	Depth Units:	ft	ft	ft	ft	ft	ft	ft			
Parameter	Parameter Code	Units	Analytical Method							, , , , , , , , , , , , , , , , , , , ,			
ALUMINUM	7429-90-5	mg/kg	SW6010	4190	562	3000	1200	1220	7310 .	1960	0.03	0.04	0.03
ANTIMONY	7440-36-0	mg/kg	SW6010	57.1	37.2	48.3	229	145	13.0 U	1.7 U	0.01 U	0.01 U	0.01 L
ARSENIC	7440-38-2	mg/kg	SW6010	5870	947	2000	. 915	1300	83.4	39.5	0.01 U	0.01 U	0.01 L
BARIUM	7440-39-3	mg/kg	SW6010	778 ·	383	372	1040	1150	128 .	29.2	0.20 U	0.20 U	0.20
BERYLLIUM	7440-41-7	mg/kg	SW6010	0.1 U	0.1 U	0.1 U	0.3 U	0.3 U	0.8 U	0.2 U		0.001 U	0.001 L
CADMIUM	7440-43-9	mg/kg	SW6010	2.5	1.4	. 0.8	9.6	6.9	17.4 .	0.4 J	0.00 /U	0.004 U	0.004 L
CALCIUM	7440-70-2	mg/kg	\$W6010	26000	23300	4190	2760	579 J	50900	928	0.11	0.05	0.11
CHROMIUM	7440-47-3	mg/kg	SW6010	45.7	. 7.9 ·	12.5	14.4	1.8	4.7	9.8	0.00	0.01 U	
COBALT	7440-48-4	mg/kg	SW6010	10,2	75.9	32.9	65.8	23.3	250	6.5	0.05 ' U	0.05 U	
COPPER	7440-50-8	mg/kg	SW6010	660 -	31300	564.0	3470	1210	1830	42.1	0.03 U	0.03 U	
IRON	7439-89-6	mg/kg	SW6010	176000	23100	111000	294000	285000	47400	13100	0.03	0.10 U	
LEAD	·7439-92-1	mg/kg	SW6010	4940	1540	3570	9640	8020	115 ,	103	0.00 · U	0.003 U	0.003
MAGNESIUM	7439-95-4	mg/kg	SW6010	107 J	68.5 J	· 480 J	166 J	157 J	511 J	568	5.00 U	5.0 U	
MANGANESE	7439-96-5	mg/kg	SW6010	26.6	40.1	36.5	73.1	62.6	460	261	0.00	0.001	0.02
NICKEL	7440-02-0	mg/kg	SW6010	2.6 J	9.3	5.1 J	18.3	6.2	63.6	24	0.00	0.04 U	
POTASSIUM	7440-09-7	mg/kg	SW6010	3910	287 J	469 J	697 J	1850	174 J	220 J	0.11	10.0 U	
SELENIUM	7782-49-2	mg/kg	SW6010	22.3	23 U	33.6	42.6	32.9	6.7 J	2.1 U		0.01 U	U.U.
SILVER	7440-22-4	mg/kg	SW6010	10.8	2.4	4.4	27.1	20	1,4	1.0 U		0.01 U	
SODIUM	7440-23-5	mg/kg	SW6010	4800	89.5 U	741 J	1200 U					10.0 U	5.51
THALLIUM	7440-28-0	mg/kg	SW6010	49.2 J	120 U	1.3 U	58 U	61 U		1.0 U		0.01 U	0.01 U
VANADIUM	7440-62-2	mg/kg	SW6010	12.5	4.5 J	8.6	29 U	<u> </u>	6.7	13.9	0.05 U	0.05 U	0.05
ZINC	7440-66-6	mg/kg	SW6010	163	53	172	1140	1460	19200	57.1	0.01	0.03	0.004
MERCURY	7439-97-6	mg/kg	SW7471	5.9	1.2 ·	6.7	10.5	3.0	1.4	0.2	0.01	0.01	0.004
MERCURY	7439-97-6	mg/kg	SW7470								0.0002	0.0002 U	0.0001
TOTAL ORGANIC CARBON	TOC	mg/kg	SW9060	18800	78100	102000	101000	1940	157000	54600	0.52	1.0 U	0.64

Notes:

J: Indicates the concentration was estimated

U: Indicates the parameter was not detected at or above the method reporting limit sh

Table 5B
Summary of Soil Sampling Results - SPLP Metals
Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

					Location:	SB-28		SB-30		SB-31		SB-34		SB-36		SB-38	SLG-01
					Field Sample ID:	SB-28-3.4-060	507	SB-30-2.5-06	0507	SB-31-1.1-06	0507	SB-34C-1.3-06	0407	SB-36-1.7-06	0607	SB-38-2.5-06060	SLG-01-0.1-06040
					Date:	6/5/2007		6/5/2007		6/5/2007		6/4/2007		6/6/2007		6/6/2007	
	Higher of		. •		Start Depth:	2.9		1.5		. 0							6/4/2007
	NJ Class	Region 9			End Depth:	3.9		3.5		2.2		0.9		1.2		1.7	0
	IIA and	Tap Water										1.6		2.2		3.4	0.2
Parameter	PQL	PRG	Parameter Code	Units	Depth Units: Analytical Method	ft		ft		ft ft		ft		ft		ft	ft
ALUMINUM	200	36499	7429-90-5		SW6010	1700		870				222					
ANTIMONY	6	, 14.6	7440-36-0	μg/l μg/l	SW6010	200	U	200	U	98 26	U	860 .		45	U		960
ARSENIC	3	0.045	7440-38-2	µg/l	SW6010	58	- 1	17	- 0	14	U	· 1200	υ	15	J	64	J 200 L
BARIUM	2000	2555	7440-39-3	µg/l	SW6010	10	U	13	U.	11	U	9	U	140 . 15	J	96	J 14 L
BERYLLIUM	1	73	7440-41-7	µg/l	SW6010	5	U	5	U	5	U	5	Ü	. 15	U	 	J 16 U
CADMIUM	4	18.2	7440-43-9	µg/l	SW6010	5		5	- U	5	U	5	U	8		5	J 5 . U
CALCIUM	NA	NA NA	7440-70-2	µg/l	SW6010	35000		8100		55000	- 0	41000		534000		153000	5 L
CHROMIUM	70	109.5	7440-47-3	µg/l	SW6010	10	U	3	j	1	Ĵ	2		10	U		J 5
COBALT	· NA	730	7440-48-4	µg/l	SW6010	50	U	50	Ü	3	U	50	U	36		85	50 L
COPPER	1300	1460	7440-50-8	µg/l	SW6010	6	Ū	3	U	4	Ü	27		5.	· U		7 .
IRON	300	10950	7439-89-6	μg/l	SW6010	100	Ü	720		79	J	100	Ū	2000	<u>~</u>	72	1700
LEAD	5	NA	7439-92-1	μg/l	SW6010	500	U	7	J	500	U	500	U	2200		710	17
MAGNESIUM	NA	NA .	7439-95-4	μg/l	SW6010	130	U	1300	J	1500	J	170	U	1100	J	890	1600
MANGANESE	50	876	7439-96-5	μg/l	SW6010	2	U	10	J	50		· 1	Ū	88		67	23
MERCURY	2	10.9	7439-97-6	μg/l	SW7470	0	U	0	U	0	U	0	J	0	U		0 1
NICKEL	100	730	7440-02-0	μg/l	SW6010	40	U	40	U	8	U	3	U	160	-	73	4 1
POTASSIUM	NA	NA	7440-09-7	μg/l	SW6010	1500	υ	1500	U	2300	U	1800	Ū	5200	J		J 1200 L
SELENIUM	40	182.5	7782-49-2	μg/l	SW6010	500	U	500	U	500	U	500	U	500	U		500 L
SILVER	40	182.5	7440-22-4	μg/l	SW6010	10	U	10	U	10	U	10	U	2	U) 10 U
SODIUM	50000	NA	7440-23-5	μg/l	SW6010	2300	U	5800	U	4500	U	8700	J	5700	υ		13000 L
THALLIUM	2	2.4	7440-28-0	μg/l	SW6010	200	U	200	Ü.	. 200	Ü	200	U	200	U	200	200 U
VANADIUM	60	36.5	7440-62-2	μg/l	SW6010	10	J	8	U	3	U	9	J	6	U	50	J 4 U
ZINC	2000	10950	7440-66-6	μg/l	SW6010	23	U	12	U	11	U	9	U	1300		700	27 U

Notes:

Leachate samples prepared for analysis using the Synthetic Precipiation Leachate Procedure (SPLP) using USEPA Method 1312

J: Indicates the concentration was estimated

U: Indicates the parameter was not detected at or above the method reporting limit shown

Table 5C

Summary of Soil Sampling Results - Volatile Organic Compounds
Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

Parameter			1	Location:	SB-30	
Date: Start Depth: 1.5						507
Parameter	•		1			
Parameter						
Parameter			ŀ			
Parameter Code	•					
OXYLENE 95-47-6 mg/kg SW8260 2.8 L XYLENES, M & P XYLENES1314 mg/kg SW8260 5.5 L XYLENES, M & P XYLENES1314 mg/kg SW8260 14 L 1,1,2-ZTERACHLOROETHANE 79-34-5 mg/kg SW8260 14 L 1,1,2-TRICHLOROETHANE 79-34-5 mg/kg SW8260 14 L 1,1-DICHLOROETHANE 76-13-1 mg/kg SW8260 14 L 1,1-DICHLOROETHANE 75-34-3 mg/kg SW8260 14 L 1,1-DICHLOROETHANE 75-34-3 mg/kg SW8260 14 L 1,2-DICHLOROERENEENE 120-82-1 mg/kg SW8260 14 L 1,2-DIGHLOROERENEENE 199-51-20 mg/kg SW8260 2.8 L 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 2.8 L 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 2.8 L 1,2-DICHLOROETHANE </th <th>Parameter</th> <th>Parameter Code</th> <th>Units</th> <th></th> <th><u> </u></th> <th></th>	Parameter	Parameter Code	Units		<u> </u>	
XYLENES, M. A. P					2.8	Ü
1,1,1-FRICHLOROETHANE			+			- Ū
1,1,2,TETRACHLOROETHANE				····		- Ŭ
1,1,2-TRICHLOROETHANE						Ū
1,1,2-TRICHLOROTRIFLUOROETHANE 76-13-1 mg/kg SW8260 14 L 1,1-DICHLOROETHANE 75-34-3 mg/kg SW8260 14 L 1,1-DICHLOROETHENE 75-35-4 mg/kg SW8260 14 L 1,2-A-TRICHLOROERZENE 120-82-1 mg/kg SW8260 14 L 1,2-A-TRICHLOROERZENE 120-82-1 mg/kg SW8260 28 L 1,2-DIGROMO-3-CHLOROPROPANE 1996-12-08 mg/kg SW8260 28 L 1,2-DIGROMO-3-CHLOROPROPANE 1996-12-08 mg/kg SW8260 28 L 1,2-DIGHLOROETHANE 106-93-4 mg/kg SW8260 28 L 1,2-DIGHLOROETHANE 107-06-2 mg/kg SW8260 28 L 1,2-DIGHLOROPROPANE 1995-50-1 mg/kg SW8260 2.8 L 1,2-DIGHLOROPROPANE 78-87-5 mg/kg SW8260 14 L 1,2-DIGHLOROPROPANE 78-87-5 mg/kg SW8260 14 L 1,2-DIGHLOROPROPANE 78-87-5 mg/kg SW8260 14 L 1,3-DIGHLOROPROPANE 78-87-5 mg/kg SW8260 14 L 1,3-DIGHLOROPROPANE 78-83-3 mg/kg SW8260 14 L 1,3-DIGHLOROBENZENE 106-46-7 mg/kg SW8260 14 L 1,3-DIGHLOROBENZENE 106-46-7 mg/kg SW8260 14 L 2-BUTANONE 78-93-3 mg/kg SW8260 28 U 2-BUTANONE 78-93-3 mg/kg SW8260 28 U 2-BEXANONE 591-78-6 mg/kg SW8260 14 L 4-METHYL-2-PENTANONE 108-10-1 mg/kg SW8260 14 L ACETONE 67-64-1 mg/kg SW8260 14 L ACETONE 67-64-1 mg/kg SW8260 14 L ACETONE 75-2-2 mg/kg SW8260 14 L BROMODICHLOROMETHANE 75-25-2 mg/kg SW8260 14 L CARBON DISULIDE 75-15-0 mg/kg SW8260 14 L CARBON DISULIDE 75-15-0 mg/kg SW8260 14 L CARBON DISULIDE 75-15-0 mg/kg SW8260 14 L CARBON TETRACHLORIDE 56-23-5 mg/kg SW8260 14 L CHLOROGENZENE 108-90-7 mg/kg SW8260 14 L CHLOROGENZENE 108-90-7 mg/kg SW8260 14 L CHLOROMETHANE 75-27-8 mg/kg SW8260 14 L CHLOROFORM 67-66-3 mg/kg SW8260 14 L CHLOROFORM 67-66-3 mg/kg SW8260 14 L CHLOROFORM 67-66-3 mg/kg SW8260 14 L CHLOROETHANE 75-27-8 mg/kg SW8260 14 L CHLOROETHANE 75-27-8 mg/kg SW8260 14 L CHLOROETHANE 75-27-8 mg/kg SW8260 14 L CHLOROETHANE 75-28-9 mg/kg SW8260 14 L CHLOROETHANE 75-29-0 mg/kg SW8260 14 L CHLOROETHANE 75-29-0 mg/kg SW8260 14 L CHLOROETHANE 75-29-0 mg/kg SW8260 14 L CHLOROETHENE 106-40-4 mg/kg SW8260 14 L CHLOROETHENE 106-40-4 mg/kg SW8260 14 L CHLOROETHENE 1		79-00-5				Ū
1,1-DICHLOROETHANE 75-34-3 mg/kg SW8260 14 L. 1,1-DICHLOROETHENE 75-35-4 mg/kg SW8260 14 L. 1,1-DICHLOROETHENE 75-35-4 mg/kg SW8260 14 L. 1,2-DIBROMO-3-CHLOROPROPANE 1996-12-08 mg/kg SW8260 2.8 L. 1,2-DIBROMO-3-CHLOROPROPANE 1996-12-08 mg/kg SW8260 2.8 L. 1,2-DIBROMO-3-CHLOROPROPANE 1996-12-08 mg/kg SW8260 2.8 L. 1,2-DICHLOROBENZENE 95-50-1 mg/kg SW8260 2.8 L. 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 2.8 L. 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 2.8 L. 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 14 L. 1,2-DICHLOROETHANE 107-06-2 mg/kg SW8260 14 L. 1,2-DICHLOROBENZENE 541-73-1 mg/kg SW8260 14 L. 2-DICHLOROBENZENE 541-73-1 mg/kg SW8260 14 L. 2-DICHLOROBENZENE 106-46-7 mg/kg SW8260 2.8 U SPI-78-8 mg/kg SW8260 14 L. SPI		76-13-1				Ū
1,1-DICHLOROETHENE	1,1-DICHLOROETHANE					Ū
1,2,4-TRICHLOROBENZENE 120-82-1 mg/kg SW8260 14						Ū
1,2-DIBROMO-3-CHLOROPROPANE	1,2,4-TRICHLOROBENZENE	120-82-1	 			Ū
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METHYLCYCLOHEXANE 108-87-2 mg/kg SW8260 14 L METHYLENE CHLORIDE 1975-09-02 mg/kg SW8260 14 L STYRENE 100-42-5 mg/kg SW8260 14 L TETRACHLOROETHENE 127-18-4 mg/kg SW8260 14 L TOLUENE 108-88-3 mg/kg SW8260 2.8 L TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 L TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 L TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 L TRICHLOROFILUOROMETHANE 75-69-4 mg/kg SW8260 14 L VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	METHYL TERT-BUTYL ETHER					Ü
METHYLENE CHLORIDE 1975-09-02 mg/kg SW8260 14 U STYRENE 100-42-5 mg/kg SW8260 14 U TETRACHLOROETHENE 127-18-4 mg/kg SW8260 14 U TOLUENE 108-88-3 mg/kg SW8260 2.8 U TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 U TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 U TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 U TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 U VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 U	METHYLCYCLOHEXANE	108-87-2				Ü
STYRENE 100-42-5 mg/kg SW8260 14 U TETRACHLOROETHENE 127-18-4 mg/kg SW8260 14 U TOLUENE 108-88-3 mg/kg SW8260 2.8 U TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 U TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 U TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 U TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 U VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 U	METHYLENE CHLORIDE	1975-09-02				Ū
TETRACHLOROETHENE 127-18-4 mg/kg SW8260 14 U TOLUENE 108-88-3 mg/kg SW8260 2.8 U TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 U TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 U TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 U TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 U VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 U	STYRENE	100-42-5				U
TOLUENE 108-88-3 mg/kg SW8260 2.8 L TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 L TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 L TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 L TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 L VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	TETRACHLOROETHENE	127-18-4				U
TRANS-1,2-DICHLOROETHENE 156-60-5 mg/kg SW8260 14 L TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 L TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 L TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 L VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	TOLUENE	108-88-3	mg/kg	SW8260	2.8	U
TRANS-1,3-DICHLOROPROPENE 10061-02-6 mg/kg SW8260 14 L TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 L TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 L VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	TRANS-1,2-DICHLOROETHENE	156-60-5	mg/kg			U
TRICHLOROETHENE 1979-01-06 mg/kg SW8260 14 U TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 U VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 U	TRANS-1,3-DICHLOROPROPENE	10061-02-6				Ū
TRICHLOROFLUOROMETHANE 75-69-4 mg/kg SW8260 14 L VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	TRICHLOROETHENE	1979-01-06				Ü
VINYL CHLORIDE 1975-01-04 mg/kg SW8260 14 L	TRICHLOROFLUOROMETHANE	75-69-4				Ü
VAVI - NI - (A - (VINYL CHLORIDE					- U
	XYLENES, TOTAL	1330-20-7	mg/kg	SW8260	5.6	U

Notes:
J: Indicates the concentration was estimated

U: Indicates the parameter was not detected at or above the method reporting limit shown

Table 5D name Su Summary of Soil Sampling Results - Semi-Volatile Organic Compounds Characterization of Cinder/ Ash and Reddish-Purple Soils & Supplemental RI Sampling Quanta Resources Superfund Site, OU1 Edgewater, New Jersey

			Location:	SB-28	- 1	SB-29		SB-30		Equip Bla	ank
			Field Sample ID:	SB-28-6.3-06050	7	SB-29-6.7-060	507	SB-30-2.5-06	0507	EB-06050	
			Date:	6/5/2007		6/5/2007	-	6/5/2007		6/5/200	
			Start Depth:	5,6		5		1.5		0,0,200	-
•			End Depth;	7	-+	· 8,4		3.5			
			Depth Units:	ft		ft		ft		ft	
D	Parameter Code	Units	Analytical Method					- 11			
Parameter 2,4,5-TRICHLOROPHENOL						· · · · · · · · · · · · · · · · · · ·					
	95-95-4	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.011	
2,4,6-TRICHLOROPHENOL	1988-06-02	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.011	
2,4-DICHLOROPHENOL	120-83-2	mg/kg	SW8270	1.2	U	1.2	U	1,7	U	0.011	ī
2,4-DIMETHYLPHENOL	105-67-9	mg/kg	SW8270	1.7		1.2	U	14.8		0.011	ι
2,4-DINITROPHENOL	51-28-5	mg/kg	SW8270	4.8	LL	4.8	_ U	6.9	U	0.043	ι
2,4-DINITROTOLUENE .	121-14-2	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	Ĺ
2,6-DINITROTOLUENE	606-20-2	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	٠ (
2-CHLORONAPHTHALENE	91-58-7	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.011	ι
2-CHLOROPHENOL	95-57-8	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.011	ī
2-METHYLNAPHTHALENE	91-57-6	mg/kg	SW8270	127		0.5		300		0.004	Į.
2-METHYLPHENOL	95-48-7	mg/kg	SW8270	0.4	J	1.2	U	4.9		0.011	
2-NITROANILINE	88-74-4	mg/kg	SW8270	1,2	Ū	1.2	Ü	1.7	Ü	0.011	ī
2-NITROPHENOL	88-75-5	mg/kg	SW8270	1,2	ū	1,2	Ü	1.7	Ü	0,011	
3&4-METHYLPHENOL	34METPH	mg/kg	SW8270	4.6		1.2	Ü	11.2		0.011	·
3,3'-DICHLOROBENZIDINE	91-94-1	mg/kg	SW8270	1,2	U	1.2	LUJ	1.7	UJ	0.011	
3-NITROANILINE	1999-09-02	mg/kg	SW8270	1.2	UJ	1.2	UJ	1.7	U	0.011	
4,6-DINITRO-2-METHYLPHENOL	534-52-1	mg/kg	SW8270	4.8	03		U		u u		
4-BROMOPHENYL PHENYL ETHER	101-55-3	mg/kg mg/kg	SW8270	0,5	031	4.8		6,9		0.043	
4-BROMOPHENTL PHENTL ETHER 4-CHLORO-3-METHYLPHENOL	59-50-7		SW8270			0.5	U	0.7	U	0.004	
		mg/kg		1.2	U	1.2	U	1.7	U	0.011	L
4-CHLOROANILINE	106-47-8	mg/kg	SW8270	1.2	UJ	1,2	UJ	1.7	UJ	0.011	L
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	\
4-NITROANILINE	100-01-6	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.011	L
4-NITROPHENOL	100-02-7	mg/kg	SW8270	4.8	U	4.8	U	6.9	U·	0.043	ι
ACENAPHTHENE	83-32-9	mg/kg	SW8270	260		2.8		318		0.004	ī
ACENAPHTHYLENE	208-96-8	mg/kg	SW8270	5.4		1.0		19.7		0.004	L
ANTHRACENE	120-12-7	mg/kg	SW8270	502		7.0	/	556		0.004	ι
BENZO(A)ANTHRACENE	56-55-3	mg/kg	SW8270	437		15.7		438		0.004	ι
BENZO(A)PYRENE	50-32-8	mg/kg	SW8270	399		13,7		354		0.004	ι
BENZO(B)FLUORANTHENE	205-99-2	mg/kg	SW8270	288	\dashv	15.0		300		0.004	
BENZO(G,H,I)PERYLENE	191-24-2	mg/kg	SW8270	223		6.1		159		0.004	$\vec{}$
BENZO(K)FLUORANTHENE	207-08-9	mg/kg	SW8270	206	-	11.7		253		0,004	$-\ddot{\iota}$
BIS(2-CHLOROETHOXY)METHANE	111-91-1	mg/kg	SW8270	0,5	U	0.5	υl	0.7	U	0.004	- -
BIS(2-CHLOROETHYL)ETHER	111-44-4	mg/kg	SW8270	0.5	ül	0.5	ü	0.7	Ü	0.004	-
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	mg/kg	SW8270	0.5	ü	0.5		0.7	U		
BUTYLBENZYL PHTHALATE	85-68-7	mg/kg	SW8270	0.5	-0		- u			0.004	
CARBAZOLE	86-74-8		SW8270		- 01	0.5.		0.7	U	0.004	Ļ
		mg/kg		115		1.3		234		0.004	ī
CHRYSENE	218-01-9	mg/kg	SW8270	382		15.8		387		0.004	l
DI-N-BUTYL PHTHALATE	84-74-2	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	ι
DI-N-OCTYL PHTHALATE	117-84-0	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	
DIBENZO(A,H)ANTHRACENE	53-70-3	mg/kg	SW8270	59.2		2.3		65.1	J	0.004	l
DIBENZOFURAN	132-64-9	mg/kg	SW8270	131		1.6		340		0.011	L
DIETHYL PHTHALATE	84-66-2	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	į
DIMETHYL PHTHALATE	131-11-3.	mg/kg	SW8270	0.5	U	0.5	U	0.7	U	0.004	Ĺ
FLUORANTHENE	206-44-0	mg/kg	SW8270	1140		34.7		1220	$\overline{}$	0.004	ī
FLUORENE	86-73-7	mg/kg	/SW8270	282		3.8		414		0.004	i
HEXACHLOROBENZENE	118-74-1	mg/kg	′ SW8270	0.5	Ü	0.5	U	0,7	U	0,004	
HEXACHLOROBUTADIENE	87-68-3	mg/kg	SW8270	0.5	Ū	0.5	Ü	0,7	Ü	0.004	Ť
HEXACHLOROCYCLOPENTADIENE	77-47-4	mg/kg	SW8270	4.8	Ū	4.8	Ü	6.9	 j	0.043	
HEXACHLOROETHANE	67-72-1	mg/kg	SW8270	1.2	ΰ	1.2	Ü	1,7	Ü	0.011	$-\dot{\iota}$
INDENO(1,2,3-CD)PYRENE	193-39-5	mg/kg	SW8270	185	<u></u> +	6.5	 	160		0.004	
ISOPHORONE	78-59-1	mg/kg	SW8270	0.5	υl	0.5	U	0,7	U	0.004	$\overline{}$
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	mg/kg	SW8270	0,5	Ü	0.5	- 0	0.7	Ü	0.004	
N-NITROSODIPHENYLAMINE	86-30-6	mg/kg	SW8270	1.2	Ü	1.2	Ü	1.7	Ü	0.004	
NAPHTHALENE	91-20-3	mg/kg	SW8270	250	 →	0.6		~~~~			
NITROBENZENE	98-95-3	mg/kg	SW8270	0.5	U		, 	908		0.004	
PENTACHLOROPHENOL	87-86-5	mg/kg	SW8270	4.8	- 0	0.5	U	0.7	U	0.004	. (
PHENANTHRENE	1985-01-08		SW8270		<u> </u>	4.8	U	6.9	U	0.043	Ļ
PHENOL		mg/kg		1720		19.2		1830		0.004	L
	108-95-2	mg/kg	SW8270	2.6		1.2	U	1.8		0.011	ι
PYRENE	129-00-0	mg/kg	SW8270	1080		34		927		0.004	ι
1,1'-BIPHENYL	92-52-4	mg/kg	SW8270	41.0	[0.2	J	64.0	J	0.0	ι
ACETOPHENONE	98-86-2	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.0	l
ATRAZINE	1912-24-9	mg/kg	SW8270	1.2	U	1.2	U	1.7	U	0.0	ī
BENZALDEHYDE	100-52-7	mg/kg	SW8270							0.0	ī
BIS(2-CHLOROISOPROPYL)ETHER	39638-32-9	mg/kg	SW8270	0.5	U	0.5		0.7	U	0.0	
CAPROLACTAM	105-60-2	mg/kg	SW8270	0.5	บง	0.5	ŭ	0.7	- i l	0.0	-i

Notes:
J: Indicates the concentration was estimated
U: Indicates the parameter was not detected at or above the method reporting limit shown

Non- Residential Industrial Residential Minimum Maximum Average Value		NJDEP Soil Cleanup Criteria	Soil Cleanup Criteria	USEPA Region	9 PRGs	'NJDEP F	¹ NJDEP Historic FIII Database	Catabase	² July 2007 Contain Ci	² July 2007 Soil Samples Known to Contain Cinder/ Ash/ Slag/ Coal (9)	s Known to ag/ Coal (9)	July 200 Observe	³ July 2007 Soil Samples Visually Observed with Reddish-Purple Color (5)		July 2007 Soil Samples Above or Below Reddish-Purple Soil Intervals (3)	Soil Samples ish-Purple S (3)	Above or oil Intervals
Non- Residential Industrial Residential Minimum Maximum Average Value	Parameter								Minimum	Maximum		Minimum	Maximum		Minimum	Maximum	
(49) N/A N/A 76000 1000000 3210 1.5 1.		Non- Residential	Residential			Minimum		Average	Detected Value	Detected	Geometric	Detected Value	Detected	Geometric Mean	Detected Value	Detected Value	Geometric Mean
(49) 47000 700 67000 5400 0.05 1098 13.2 16.2 146 (49) 47000 700 67000 5400 0.01 79.7 1.23 0.26 24 (49) N/A N/A N/A 1900 3100 3100 3100 3100 3100 3100 3100		A/A	N/A	T	_		_		3210	18300	5771	1200	0299	2617	295	7310	1787
(82) 20 20 1.6 0.39 0.05 1098 13.2 76.2 (43) 47000 700 67000 5400 0.01 79.7 1.23 0.26 (45) 100 39 450 37 0.02 510 11.1 0.35 (46) N/A N/A N/A 1900 3400 1500 0.28 10700 574 30.5 (56) 800 800 41000 24000 (80) 800 41000 1600 (80) 800 400 800 1600 (80) 800 1600 1600 (80) N/A N/A N/A 100000 1600 (80) 83 5100 390 (56) 3100 83 5100 390 (56) 3100 83 5100 390 (56) 4100 110 5100 390 (56) 2 2 2 68 5 5 68 5 5 68 5 5 68 5 5 68 6 5 68 5 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 5 68 6 6 68 6 6 68 6 69 6 69		340	4	410	31		•		1.5	16	2.6	25.8	229	74.9	37.2	188	35.7
(49) 47000 700 67000 5400		. 02	20	1.6	0.39	0.05	1098	13.2	16.2	988	165	648	2870	1554	83	947	214
M (56) 2 2 1900 150 0.01 79.7 1.23 0.26 (49) N/A N/A N/A N/A N/A 11.1 0.35 (49) N/A N/A 1900 37 0.02 510 11.1 0.35 (49) N/A N/A 1900 900 2400 900 90 (49) N/A N/A 100000 2400 900 10200 30.5 I/M (49) N/A N/A N/A N/A N/A 10200 SE (49) N/A N/A N/A N/A N/A 1.60 M (49) N/A N/A N/A N/A N/A 1.60 SE (49) N/A N/A N/A N/A N/A 1.60 M (49) N/A N/A N/A N/A N/A 1.60 (56) 21000 300 30		47000	200	67000	2400				24	584	72	322	1150	645	96	383	167
(49) N/A N/A 450 210 510 11.1 0.35 N (49) N/A N/A 450 210 510 11.1 0.35 (49) N/A N/A 1900 900 2400 2400 24000 (49) N/A N/A 100000 24000 0.28 10700 574 10200 (80) 600 400 800 400 0.28 10700 574 10200 (80) N/A		2	2	1900	150	0.01	7.6.2	1.23	0.26	4.0	0.19	9	2	g	2	2	S
(49) N/A N/A 450 210 900 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.		100	39	450	37	0.02	510	11.1	0.35	2.3	0.51	0.83	9	2.7	0.57	17	2.4
(49) N/A N/A 450 210 9.0 (49) N/A N/A 1900 900 3.3 (56) 600 600 41000 24000 25 (49) N/A N/A 100000 24000 574 30.5 I/M (49) N/A N/A N/A N/A 735 SE (49) N/A N/A N/A N/A 7.6 M (49) N/A N/A N/A N/A 1.60 (56) 2400 250 20000 1600 7.6 M (49) N/A N/A N/A 1.60 (56) 3100 63 5100 390 1.60 (56) 4100 110 510 390 1.60 (57) 2 2 68 5 1.0 (56) 1500 10000 2400 245 1090 575 58		N/A	N/A	A/N	N/A				5420	62400	11930	629	31400	5592	5010	20800	18112
(49) N/A N/A 1900 900 24000 255 25 (54) 600 600 600 41000 2400 250 20000 1600 390 390 390 390 390 390 390 390 390 3	_	N/A	N/A	450	210				9.0	38	16.2	8.1	51.0	15.0	4.7	œ	9.9
(56) 600 600 41000 3100 3100 24000 [74] (89) NiA NiA 100000 24000 0.28 10700 574 30.5 [10200 400 0.28] (80) 600 400 800 400 0.28 10700 574 30.5 [10200 1.80] (80) NiA NiA 20000 1800 78 3.68		N/A	N/A	1900	006	-			3.3	32	8.6	10.2	65.8	22.9	6.1.9	250	33.0
(49) N/A N/A 100000 24000 (0.28 10700 574 30.5 N/A (49) N/A		900	009	41000	3100	-			25	657	94	564	3470	976	17	31300	1853
(80) 600 400 800 400 0.28 10700 574 30.5 SE (49) N/A N/A 20000 1800 7.6 (56) 2400 250 20000 1600 7.6 M (49) N/A		N/A	N/A	100000	24000				10200	83900	21016	81100	294000	167730	23100	47400	34190
SE (49) N/A N/A 20000 1800 83 735 SE (49) N/A N/A 20000 1600 1600 7.6 83 75 SE (49) N/A N/A 20000 1600 1600 7.6 83 75 SE (49) N/A		009	400	800	400	0.28	10700	574	30.5	12200	159	2640	9640	5143	115	11400	1264
SE (49) N/A N/A 20000 1800 83 (56) 2400 250 20000 1600 7.6 M (49) N/A N/A N/A N/A N/A (56) 3100 63 5100 390 1.60 0.93 (56) 4100 110 5100 390 1.60 1.60 (49) N/A N/A N/A N/A 1.00 1.60 (55) 2 2 68 5 1.0 1.0 (56) 1500 10000 24000 2.45 10900 575 58 MIII (16) N/A 450 210 NA NA MILIMOR 320 100 2400 245 10900 575 58		A/A	N/A	A/N	N/A				735	5560	1710	107	480	205	69	554	569
(56) 2400 250 20000 1600 7.6 (59) (49) N/A N/A N/A N/A N/A N/A N/A (49) N/A (49) N/A		K/N	N/A	20000	1800				83	454	152	26.6	125.0	26	40.1	460	92
(49) N/A N/A N/A N/A N/A N/A (49) (56) 3100 63 5100 390 1.60 (57) 2 2 68 5 5100 78 5100 (59) 1.60 (59) 1.50 (59) 1.50 1.000 24000 24000 575 58 1.00 N/A N/A N/A 1.11 (16) N/A N/A 1.50 1.00000 24000 24000 575 58 1.00 N/A N/A 450 210 1.00 N/A N/A 450 210 N/A N/A 450 210 N/A N/A 450 210 N/A N/A 450 210 N/A N/A 1.00 N/A N/A 1.00 N		2400	250	20000	1600				7.6	20	16.4	5.6	58.9	9.8	4.7	64	14.1
(56) 3100 63 5100 390 0.93 (56) 4100 110 5100 390 1.60 (49) N/A N/A N/A N/A N/A 1.00 (55) 2 2 68 5 1.00 (56) 1500 100000 24000 2.45 10900 575 58 MIII (16) N/A N/A 450 210 N/A N/A 320 N/A N/A 450 210	_	N/A	K/N	Ø/Z	N/A				368	1090	625	469	3910	1173	174	2380	492
(56) 4100 110 5100 390 1.60 1.60 (49) N/A N/A N/A N/A N/A N/A 1.60 (55) 2 2 68 5 1.00 (56) 1.50 1.00 2400 2.45 10900 575 58 1.00 N/A N/A 450 2.10 N/A N/A N/A N/A 450 2.10 N/A N/A N/A N/A N/A 450 2.10 N/A		3100	63	5100	380				0.93	5.5	1.4	9.00	42.60	24.8	5.1	7	7.3
(49) NJA NJA NJA NJA NJA 566 (55) 2 2 68 5 1.0 (49) 7100 370 1000 78 10900 575 58 (150) 1500 100000 24000 2.45 10900 575 58 MIII (16) NJA NJA 450 210 NJA NJA 32) NJA NJA 450 210		4100	110	5100	390				1.60	3.5	0.43	3.70	27.10	6.6	4.	2	1.8
(55) 2 2 68 5 100 (49) 7100 370 1000 78 9.9 (56) 1500 100000 24000 2.45 10900 575 58 MM MA 450 210 NA NA NA 450 210 NA NA		N/A	A/N	N/A	N/A	-			566	2320	307	741	4800	786	1120	1120	319
(49) 7100 370 1000 78 9.9 (56) 1500 1500 100000 24000 2.45 10900 575 58 MA III (16) N/A N/A 450 210 NA N/A 320 N/A N/A 450 210		2	2	89	ιΩ				1.0	1.0	Ϋ́	49.2	49.2	¥	2	g	9
(56) 1500 1500 100000 24000 2.45 10900 575 58 A III (16) N/A N/A 450 210 NA N/A 450 210 NA NA N/A 450 210		7100	370	1000	78				6.6	52	20.8	9.8	30.3	14.8	5.4	20	8.4
MIII (16) N/A N/A 450 210 NA NA MA 450 210 NA NA NA MA 450 210 NA NA NA MA		1500	1500	100000	24000	2.45	10900	575	28	716	171	163	1460	380	42	19200	349
0MIUM (32) N/A N/A 450 210 NA		N/A	A/N	450	210				¥	Ϋ́	Ϋ́	¥	Ϋ́	¥	Ϋ́	¥ Ž	Ϋ́
	HEX. CHROMIUM (32)	ΑN	ΑX	450	210			•	Ą	Ą	₹ Z	Ϋ́	Ą	Ϋ́	Ϋ́	¥	N A
(55) 270 14 310 23 0.17	MERCURY (55)	270	14	310	23				0.17	13.20	0.66	3	14	7.0	1.20	3	1.8

Characterization of Cinder/ Ash and Reddish-Purple Soils

Summary of June 2007 Soil Results

Table 6

Quanta Resources Superfund Site, OU1

Edgewater, New Jersey

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1: Values taken from Appendix D of the N.J.A.C 7:28E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005).

2. Includes samples collected during the June 2007 Soil Sampling Event where cinder, ash, slag, or coal was not visually observed in the field were later confirmed to contain significant amounts of black, glassy slag. These samples are included in this data sets despite the fact that in some cases they were observed directly above or below intervals of reddish-purple soil.

3: These samples include those that were taken from discrete intervals where reddish-purple, or dusky red discolored soils were visually observed in the field.
Values highlighted in bold and italics are at or above residential and/or industrial values for NJDEP Soil Cleanup Criteria or USEPA Region 9 Preliminary Remediation Goals (PRGs) For samples where constituents were not detected (ND), 1/2 of the detection limit was used for calculations

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm) Numbers in parentheses () indicate the total number of samples for each analyte or category

N/A: Not Available

Table 7Summary of Groundwater Sampling Results - Arsenic Supplemental RI Sampling - June 2007
Quanta Resources Site, OU1
Edgewater, New Jersey

		Screen In	terval (ft.)	Arseni	c Conce	ntration (µg/l)	
Location	Date	Start Depth	End Depth	Unfiltered	i	Filtered	
TWP-SB28	6/5/2007	8	9	34100	J	39400	J
TWP-SB29	6/6/2007	7.5	8.5	1600	J	1750	J
TWP-SB30	6/5/2007	8	9	131		129	
TWP-SB31	6/6/2007	7.5	8.5	59.0		49.5	
TWP-SB31 (duplicate)	6/6/2007	7.5	8.5	49.4		40.6	
TWP-SB32	6/6/2007	6.5	7.5	4450		4250	

Notes:

All samples analyzed for arsenic using USEPA Method SW6020

Results reported in micrograms per liter (µg/l)

Filtered samples were filtered using a 0.45 micron filter and preserved with nitric acid in the field

J: Indicates the concentration was estimated

Table 8
Cinder/Ash/Coal/Slag and Reddish-Purple Soil Observations and Sampling Summary
Characterization of Cinder/ Ash and Reddish-Purple Soils
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

				Visually Observ							Т															
	. 4.5.			Slag/ Reddi	sn-Purple I	nterval	·	İ			\vdash		-	r		Soil	Sam	pling	Ana	ytical	Sumi	nary				
-		Consultant	Total Boring	Interval Top (ft.	Interval Bottom	Thickness		Cinder/ Coal/ Ash/ Slag	Reddish- Purple Color	Sampled Interval (ft.	AHs (via 8270)		F.0	2.2	.010 .	W7471	W8081	W8082 W8260	270	012	W9045 W9060 (TOC)	SW6010	PLP, SW7470	PLP, SW8260	, SW6270	ISTM D422
Location	Property	Reference	Depth (ft.)	bgs)	(ft. bgs)	(ft.)	Field Log Description	Sampled	Present	bgs)	A A	6020	E16(E36(SW6	SW	SWB	8 8	SW8	SAS	§ 8	SPLP	7 3	4 4	STA	ASTM
MW-103A	Quanta	1	14	0.16	1.4	1.2	gravel w/ cinder, v. dark gray																	3, 0		
MW-103DS	Quanta	1	54	4.7	6.0	1.3	sandy silt w/ cinder/slag, black, soft, obvious product odor	x		5.0-6.0			x	:	x >	<	x.	x x	x x							\prod
MW-104R	Quanta	1	13	0.0	0.5	0.5	black slag/cinder material											+	T		+	\Box	+	-	+	++
MW-105A	Quanta	. 1	18	3.5	6.0	2.5	gravel with crushed brick and black cinder/slag w/in sub- angular gravel	X		3.4-3.6 3.6-3.9	1-1		X		X >			XX	` - ' `			H	\Box		1	\Box
MW-112B	Quanta	1	17	4.0	4.2	0.2	intermixed gravel and cinder/slag, v. dark gray			3.0-3.9	1-	+	 ^	+	~~	+		××	H×.	\vdash	+-	\vdash	+	+-	+	++
MW-116B	Quanta	1	15	0.0	7.0	7.0	organic silt w/ brick, cobbles, and cinder/slag/fill; various colors	×		0.0-0.16			Х		x >	(П	x x	×		1.	\sqcap		\top		\Box
	Quanta	1	15	0.0	7.0	7.0	organic silt w/ brick, cobbles, and cinder/slag/fill; various	×		1.75-2.0		1.	x		x >			x x	×			\vdash	++	\dashv	╁	++
	Quanta	1	15	0.0	7.0	7.0	colors organic silt w/ brick, cobbles, and cinder/slag/fill; various	×		4.5-5.0	H	-	×	-	x x	+-	H	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1	-+	+	\vdash	+	-	+-	+
MW-116DS	Quanta	1 1	29	2.5	3.0	0.5	colors gravel intermixed w/ fine sand and cinder/slag/fill; black			4.5-5.0	\square		1^		11	1_		X X	×	·					1.	\sqcup
						i	fine/med silty sand w/cinder/slag; various colors, obvious	-			+		+-	+	+	+-	-	+	+	+		\vdash	+		+-	+-+
MW-117A	Quanta -	1 .	17	0.0	10.0	10.0	naphthalene odor						\perp		\perp						1.					
MW-117B -	Quanta	1	18	0.0	14.0	14.0	fine/med silty sand w/ cinder/slag, naphthalene odor, sheen	х		0.0-0.16			х		x x			x x	×			П				П
	Quanta	1	18	0.0	14.0	14.0	fine/med silty sand w/ cinder/slag, naphthalene odor, sheen	х		4.0-5.5			x	,	x x			x x	×			П				П
MW-118A	Quanta	1	15	3.0	13.0	10.0	gravel and fine/med sand w/ cinder/slag; black, obvious product odor													,	-					
SB-02	Quanta	1	30	0.0	10.0	10.0	med/coarse sand w/ crushed brick, wood, cinder/slag/fill, some soft tar, various colors	х		0.0-0.16			×	,	x x		;	x x	×							
	Quanta	1 '	30	0.0	10.0	10.0	med/coarse sand w/ crushed brick, wood, cinder/slag/fill, some soft tar; various colors	Х		9.5-10.0			X		x x		;	x x	×							
. SB-03	Quanta ¹	1	22	1.0	5.0	4.0	gravel w/ cinder/slag, tar/fill; black, dry, soft and plastic; strong odor	X		0.0-0,16			х	>	x x		;	x x	×				\prod			
	Quanta	1	22	1.0	5.0	4.0	gravel w/ cinder/slag, tar/fill; black, dry, soft and plastic; strong odor	X		3.5-4.0	Ш		x	,	x x		,	x x	х							х
SB-05	Quanta	1	24 .	3.75	5.0	1.3	silty sand w/ angular gravel, cinder/slag/fill; black staining, various colors, obvious naph odor										1									
SB-06	Quanta	1	24	1.2	2.0	8.0	brick, viscous tar, cinder/slag fill; naph. Odor	Х		1.5-2.0			X	>	ΚX			ΧX	X	\pm	-		++	\dashv	+	x
TL14-09	Quanta	- 1	25	3.2	15.0	11.8	cinder/slag intermixed w/in fill, solid coal tar at 9', 12' bgs	х		4.0-6.0				>	ĸ x	×	,	×Ι×	×	,	x i		TT		×	
TL16-07	Quanta Quanta	1	25 30	3.2 0.0	15.0	11.8	cinder/slag intermixed w/in fill, solid coal tar at 9', 12' bgs	Х		10.0-12.0							- >	ΚX	Х				+		1	\vdash
TL16-09	Quanta	 	25	1.25	5.0 3.75	5.0 2.5	cinder/slag intermixed w/in fill reddish-purple gravelly silt	X -	×	0.0-2.0 1.0-3.0	Н		+		ЯX	X			X		<u> </u>		X			
	Quanta -	1	25	0.0	2.0	2.0	gravel, cinders, black and dark brown	^-	^-	1.0-3.0	1 -	+	+-+	+	-	+^		< ×	1	-	+	XX	X	<u> </u>	+-	-
TL17-06	Quanta	1	25	2.0	2.5	0.5	dusky red gravelly clay	X	Х	3.0-5.0		\perp		>	₹ x	X	\dashv	\perp		1,	(+	++	-	x	\vdash
TL17-07 TL17-08	Quanta Quanta	1	20 25	10.0	11.0 5.0	1.0	med-coarse sand w/ purplish hue	X	X	10.0-12.0						X		Ţ)		工			X	
1617-00	Quanta	1	25	0.0	5.0	5.0 5.0	intermixed cinders w/in fill, dusky red fill intermixed cinders w/in fill, dusky red fill	X	X	3.0-5.0 0.0-2.0	⊢∔	\dashv	+			X		X		1			X		X	ot
B-3	Quanta	4		6.0	7.0	1.0	wood and coal tar			0.0-2.0	╂╌┼	+	╂╼┼	-\X	\	X	-+	(X	 ^ 	- >	4-1	XX	X	X X	X	\vdash
MW-101	Quanta	4	20	2.0	2.0	trace	black cinders				1-	+	+	+	+-	+-+	-	+-	+-		+-	+	++	+	-	\vdash
MW-103	Quanta	. 4	22	3.0	4.0	1.0	cinders, brick, coal tar	Х		3.0-4.0				_ x		且		X	1.		11	+	++		1-	\vdash
MW-105 MW-106	Quanta Quanta	4	20	0.0	12.0	12.0	black cinders	X		5.0-5.0	X		\Box	X		\Box	\Box	X				工				
MW-109	Quanta	4	24	9.0	18.0 18.0	9.0	dark gray silt w/ cinders, slight marsh odor fill w/ sand, cobbles, gravel, cinders; brown	X		9.0-10.0	X	+	╄	X		\sqcup		X			\perp	工	47	T		\perp
MW-110	Quanta	4	25	9.0	13.0	4.0	cinders, sand, gravel	- X		7.0-7.5 12.0-13.0	X		+	X		1 1		-\ X		+	+-1		+-+	\perp	-	
MW-114B	115 River Road, LLC	1	29	1.0	7.0	6.0	black sandy silt w/ brick, cinder/slag/fill	- x		1.5-2.0	1^+	+	x		(x	++	-	X		+	+		++	+	+	\vdash
MW-119A	115 River Road, LLC	11	14	4.0	14.0	10.0	gravelly sand w/ crushed brick, cinder/slag	X		14.5-15.0			x		X			x		+	++	+	++	- -	+	,
MW-119B	115 River Road, LLC	1	16	4.0	16.0	.12.0	gravelly sand w/ crushed brick, cinder/slag; various colors	х		9.5-10.0			х	х	×		×	×	x							
SB-01 SB-04	115 River Road, LLC 115 River Road, LLC	1 1	20 . 30	1.0	4.0	3.0	gravelly silty sand w/ wood, cinder/slag, very dark brown	X		1.0-1.5	\Box		X		X			X	Х			5				\Box
SD-04	115 River Road, LLC	1	30	1.0 1.0	3.5 3.5	2.5 2.5	silty to coarse sand w/ cinder/slag; black	X		1.0-1.5	ш		X		X			X			\Box	\perp	\Box			
MW-101DS	Block 93	1	48	0.3	1.3	1.0	silty to coarse sand w/ cinder/slag; black fine sand w/ cinder/slag, black, dry to moist, obvious pet product odor	X		3.0-3.5	\vdash	+	X	X	X	H	 	X	X	+	+-	+	+	+	H	X
MW-111A	Block 93	1	30	5.5	6.0	0.5	med-coarse sand w/ crushed brick, cinder/slag/fill						+		+	1-1	-	+-	⊢⊹	+	+		\vdash	-	├- -	-

Table 8
Cinder/Ash/Coal/Slag and Reddish-Purple Soil Observations and Sampling Summary
Characterization of Cinder/ Ash and Reddish-Purple Soils
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

dgewater, New Jersey		1	T :	Visually Obsen	red Cinder/	Coal/ Ash/			1		Т									-	—						
			}	Slag/ Reddi				•	Ì							So	ii Sa	mpli	ng A	nalyti	ical S	umma	ary				
					Interval			Cinder/ Coal/ Ash/	Reddish- Purple	Sampled	a 8270)										T	30 (TOC)		SW8082	SW8260 SW8270	D1498	22
Location	Property	Consultant Reference	Total Boring Depth (ft.)	Interval Top (ft. bgs)	Bottom (ft. bgs)	Thickness (ft.)	Field Log Description	Slag Sampled	Color Present	interval (ft.	PAHs (v	3020	160.3	350.2	3W6010	3W7196	W8081	:W8082	:W8260	W8270	W9045	0906/	SPLP, SV	PLP, SV	SPLP, SV	STM D1	STM D4
MW-111B	Block 93	1	12	5.5	6.0	0.5	black silty sand w/ cobbles, cinder/slag and cloth/cardboard- like material, obvious odor								03	5, 5,	8	<i>v</i>	<u> </u>	5 0	Ť		715	5	7	4	4 4
SB-10	Block 93	1	26	0.8	6.0	5.2	sub-angular gravel w/ brick, cinder/slag; black, product stain and odor	×		3.0-4.0			x		x	x x	+	х	×	×	+	\Box	+	\vdash	+	H	+
SB-11	Block 93	1	24	0.0	. 9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	×		0.0-0.16			х	1	x	x x	:	x	x	x x	,	H	\top	11	+	\vdash	+
	Block 93	1	24	0,0	9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	х		1.5-2.0		.	x		x	x x	:	x	x	x >	,	H	+	\vdash	+	+	+
	Block 93	1	24	0.0	9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	х		4.5-5.0			X	T	х	x x	:	x	x	x x	,		+	\sqcap	_	Ħ	+
SB-13	Block 93	1	12	1.0	6.0	5.0	coarse sand w/ cinder/slag/fill; black,layered cardboard-like mat., tar-like product and petro. odor	×		0.0-1.0			×	x	х	x x		×	x	x x	,		1	\sqcap	+	\Box	+
	Block 93	1 .	12	1.0	6.0	5.0	coarse sand w/ cinder/slag/fill; black, layered cardboard-like mat., tar-like product and petro. odor	×		1.0-2.0			×	x	x	x x		×	×	x x	,						T
SB-19	Block 93	1	20	0.0	8.0	8.0	intermixed sandy gravel, crushed brick and black cinder/slag	×		1.0-3.0					х	×			×	x	\top	\Box		Ħ	\top	\prod	
20.25	Block 93	1	20	0.0	8.0	8.0	intermixed sandy gravel, crushed brick and black cinder/slag	Х		4.0-6.0					X,	×		П	x	х	\top		1	\prod	\top	\prod	\dagger
SB-20 SB-21	Block 93 Block 93	1 1	30 25	0.0	6.0 8.0	6.0 7.5	intermixed black cinder/slag w/in fill (throughout)	Х		5.0-7.0					Х	X				士	1			\vdash	+	\vdash	_
36-21	Block 93	+	25	0.5	8.0	7.5	intermixed cinder/slag (w/in fill); obvious odor in bottom 3' intermixed cinder/slag (w/in fill); obvious odor in bottom 3'	X		1.0-3.0 5.0-7.0	+	-	_		X	X			X .		\perp						工
SB-22	Block 93	1	25	1.5	18.5	17.0	intermixed clader/slag w/in fill, viscous black product, solid tar	×	-	1.0-3.0	1	+	\vdash		X	X X X	+	\vdash	Х	<u>*</u> -	+	\vdash	+	\vdash	+	x	+
	Block 93	1	25	1,5	18.5	17.0	intermixed black cinder/slag w/in fill, viscous black product, solid tar	Х		15.0-17.0	\Box	-	+	-	x	-	+	\vdash	十	+	+	\vdash	+	+	+	r x	+
SB-23	Block 93	1	20	0.0	9.0	9.0	intermixed silt and gravel, dk brown cinder/slag w/in fill (throughout)	Х		0.0-2.0			+		\vdash	+	┢	x	\dashv	+		\vdash	+	\vdash	+	H	+
SB-23	Block 93	1	20	. 0.0	9.0	9.0	intermixed silt and gravel, dk brown cinder/slag w/in fill (throughout)	Х		2.0-4.0			T	-	х	X		x	x :	х	+	\vdash	+	\vdash	+	\vdash	+
SB-24	Block 93	1	25	0.5	6.0	5.5	intermixed silt, cinders and crushed gravel	X		0.0-2.0			+		x	$\frac{1}{x}$	+	\vdash	x :	$\frac{1}{x}$	+x	+	+	\vdash	+	x	+
SB-25	Block 93	11	35	0.0	10.0	10.0	trace black cinders w/in fill	X		0.0-2.0							1		X		+	\vdash			+-	 	+
SB-27	Block 93 Block 93	1 1	35	0.0	10.0	10.0	trace black cinders w/in fill	X		7.0-9.0									X :	X			1		1	广	_
TL12-10.75	Block 93	1	30	8.25 0.0	10.0 16.25	1.8 16.25	black staining and some cinder/slag w/in fill cinders w/in fill; noticable product odor, black broduct and	X		9.0-10.0 0.0-2.0	H	+	+	Н		-	-	Ų	+	+	尹	H	\mp	H	尹	H	-
TL14-10.75	Block 93	1	25	1.0	20.0	19.0	incandescent sheen cinder/slag intermixed w/in fill	×		1.0-3.0	H	-	+		x	×	-	X	x	x	+	\vdash	4-	\vdash	\dashv	$\vdash \vdash$	+
	Block 93	1	25	1.0	20.0	19.0	cinder/slag intermixed w/in fill	X		14.0-16.0					Х	X	1	x		x	\Box		-		+	\sqcap	_
TL12.5-11.75	Block 93	1	25	0.0	10.0	10	cinder/slag intermixed w/in fill										\top	П		+	+		+-	\vdash	+-	一十	+
TL12.5-12.25 TL12-11.75	Block 93 Block 93	1 1	30 25	0.7 0.0	4.3 16.25	3.55 16.25	cinder/slag intermixed w/in fill intermixed cinders w/in fill				1				_[\perp	\Box		ユ		\square						士
TL14-11.25	Block 93	 	30	5.5	6.8	1,3	black, brittle coal tar				\vdash		+	\vdash	-	_	↓_	\vdash	-	-	11	\perp	\perp	\vdash	1.1	I	工
TL15-10.75	Block 93	1	50	4.25	7.5	3.3	crushed cinder/slag w/in fill; sheen and product odor				+	+	+	\vdash	-		-	\vdash	+	+	+				\dashv	\vdash	+
TL17-05	Edgewater	1	30	3.5	5.0	1.5	some crushed cinder/slag w/in fill				+	+	+-	-	-	_	+-		-	+	+		+	+	+	+	+
TL18.5-01.5	Edgewater	1 1	25	17.5	20.0	2.5	traces dark gray fibrous wood							\Box	\neg	_	1	\Box	-	+	+	_	+		+	_	+
TL19-0.5 SS-18B	Edgewater	1 2	30	27.5 13,0	27.5 14.0	0.0	trace wood w/in fractured rock; obvious odor	X		28.0-29.5			1					Х	x >	x			+-	\vdash	+	-	+
SS-19.5B	Edgewater Edgewater	2	22.5 18	11,0	11.0	1.0 trace	little slag w/in fill 3-4" grey ash	X		14.5-15.0	X	┵.	╀	\sqcup	_		1_			\perp	\Box		\Box	\perp	\Box	\perp	
SS-20C	Edgewater	2	16	14.0	14.5	0.5	black sandy silt w/ wood				\vdash	- -	-				ــ	-		-	11		\perp		\perp		1
SS-22B	Edgewater	2	20	13.5	14.8	1.3	purple lenses, trace wood	×	×	14.0-14.5	x	+-	+-	⊢⊦	-		┼—	┝╌┤	+	+	\vdash	-	╨	\vdash	\dashv		4
SS-23A	Edgewater	2	21.5	12.0	17.0	5.0	black slag w/in sandy fill; throughout interval	x	^:	10.0-14.0	 î 		+	\vdash			-		+	+-	+		┵		++		+-
SB-V12	Edgewater	3	17	4.0	7.0	3.0	purple-red silt	Х	Х	6.0-6.5		хx		\vdash	_	X	x	x	\times	\times	+-		+-	-	+		+-
SB-W10	Edgewater	3	22	7.0	8.0	1.0	purple fine sand		Х				T-				1		-	+	T	_	+	-	++	+	+
SB-W11 SB-W12	Edgewater	3	24	8.0	9.0	1.0	purple-red and black clay	X	Χ	8.0-8.5		ΧX					Х		X >				17			\neg	1
SB-W12 SB-W21	Edgewater Edgewater	3	20 15	6,0 6,0	10.5 13.0	4.5 7.0	purple-red silt, clay	X	X	9.5-10.0		X X		П	\bot				X >		\Box			工			I
MW-A-1	Edgewater	7	28	12.5	14.0	1.5	wood fragments, coal pieces in fill purplish-red fine sand	X		9.0-9.5	-	x x	+	\sqcup	-	- X	X	X	X >	<u> </u>	\coprod	$-\Gamma$		\bot	$\bot \Box$	工	I
MW-A-2	Edgewater	7	22	12.5	14.0	1.5	purplish-red fine sand		×		\vdash		1	\vdash			+	\vdash			╁╌┤	-	44		44	——	4
MW-D	Edgewater	7	12	9.0	10.0	1.0	black fill w/ cinders	-	^		 -	+	+-	\vdash	+		-		+	+	+	+	4-1		+		+
MW-F	Edgewater	7	17	16.0	16.5	0.5	fill/silt w/ cinders, gravel				\vdash	- -	+	1-		+-	+	+	+	+-	+-+	-+-	+	+	+	+	+
MW-I	Edgewater	7	19.5	12.0	13.0	1.0	blk/brown fill w/ cinder, ash				1	\dashv	+	-	+	\dashv	\vdash	-+	+	+-	+-+		+	+	+	+	+
MW-J	Edgewater	7	21	14.5	15.5	1.0	black wood fragments						1		_	\top	\vdash	\vdash	+	+	+-	+	+-+	+	+-+	+	+
MW-K	Edgewater	7	20	10.0	10.5	0.5	gray fill w/ black cinders								\top		\vdash		\top	+	\Box	+	+-+	+	++	+	+
MW-M	Edgewater	7	26	6,0	14.0	8.0	traces coal and slag	X		9,2-9,7		Т			X		Г		\neg	\top		_	+-+		11	-	+

Table &
Cinder/Ash/Coal/Slag and Reddish-Purple Soil Observations and Sampling Summary
Characterization of Cinderl Ash and Reddish-Purple Soils
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

		-		Visually Observ					Γ		Т			_	_				_			—							
		1		Slag/ Redui	Sir-ruipie i	HILEFVAI					 			_		,	So	il Sa	mpl	ing A	Analy	tical !	Sumr	nary					
		1									٦	. [- 1			ı	-	1								'			
1	ì					1		Cinder/	Reddish-	Ī	24												(TOC)	용	2 2	. 8	2	_	
			Tatal Barrier		Interval			Coal/ Ash/	Purple	Sampled	\$			- 1	١.	١.	۱.	. _	_			. .	Ĕ	8	SW7470 SW8082	SW8260	SW82	D1498	D431
Location	Property	Consultant Reference	Total Boring Depth (ft.)	Interval Top (ft.	Bottom	Thickness	Folder - B	Slag	Color	Interval (ft.	AHs (e	-	160,3	350.2	01090	1 5	V8081	W8082	W8260	W8270	W9012	V9060		8,9,9	. 8	8.	2 2	2 2
		 		bgs)	(ft. bgs)	(ft.)	Field Log Description	Sampled	Present	bgs)	Α	802	8	E16	E36	8 8	}	NS.	S.	S.W.	SW	% X	NS.	집	SPLP,	SPLP,	됩	ASTM ASTM	AST
MW-N-1	Edgewater	7	26	7.5	8.5	1.0	red-purple sand w/ silt, coal		X	-				T		Т		\top	П	П	П	Т	1		\top		\sqcap	\top	\top
MW-N-2	Edgewater	7	16	7.5	8.5	1.0	red-purple sand w/ silt, coal		X		1		\neg	_	\neg	_	+	+	+	+	\vdash		+-	\vdash	-	+	\vdash	+	+
MW-N-3	Edgewater	7	60	7.5	8.5	1.0	red-purple sand w/ silt, coal		Х					7	\top	\top	\top		1	\vdash	\vdash	+	+-	\vdash	_	+-	\vdash		+
MW-O GZA-32	Edgewater Former Lever Bros.	7 5	20 17	1.5	4.0 10.0	2.5	fill w/ sand, gravel and cinders; brown										\top	\top	+	\vdash			+-		+	+-	\vdash	+	+
GZA-32 GZA-35	Former Lever Bros.	5	5	0.0	5.0	6.0 5.0	little wood w/in fill (not burnt)	X		2.0-4.0			_	\Box		Χ			Х		Х				\neg	\top	\vdash	+	+
GZA-36	Former Lever Bros.	5	4	0.0	4.0	4.0	little coal w/in fill trace coal w/in fill	X		3.5-4.0				4	_	4	- -	1	X				T					\perp	
GZA-38	Former Lever Bros.	5	5	4.0	5.0	1.0	white flakes of ash and coal w/in black sand/gravel	x		3.5-4.0 3.5-4.0	-		-+	-		+	_	+-	1 X	\sqcup	+-+	_	-	\vdash	\dashv	\perp	-	\perp	\perp
GZA-42	Former Lever Bros.	5	10	1.5	4.8	3.3	little coal and cinders win sandy fill			3.5-4.0	1-		-+	+		+		+-	X	1-1	\vdash	+	┼-	\vdash				-	
GZA-43	Former Lever Bros.	5	20	0.75	9.00	8.3	cinders w/in sand/gravel fill	X		4.0-4.5	+		\dashv	+	٠,	x -	+	+	+	1x	×	+	+	-	+	┰	\vdash	-	╁┥
. GZA-45	Former Lever Bros.	5	15	0.0	10.0	10.0	little cinders, coal, ash and timbers w/in black sandy fill	Х	i	2.0-3.0		\neg	\dashv	+		x l	+	+-	x	-	î	+			+	+	_	+	+- 1
GZA-46	Former Lever Bros.	5	15	0.0	5.0	5.0	little cinders and black coal seams w/in fill (throughout	X			1-	-	-	+		-	-	+	+^	+	Ĥ	+	┼	\vdash	+		\vdash	+	44
GZA-47	Former Lever Bros.	5	15	0.0			interval)			4.0-5.0					-13	x	ſ		ì	X				-			,		11
GZA-47 GZA-48	Former Lever Bros.	5	15	7.5	3.0 15.0	3.0	little coal and ash w/in fill					_										1	_		\top		_	+	1
GZA-49	Former Lever Bros.	5	10	6.0	10.0	7.5 4.0	little cinders win black sandy fill; mothball-like odor, wet	X		9.0-10.0	1				2					X								\top	\top
B-7	Former Lever Bros.	6	12	7.0	7.0	trace	little cinder and ash w/in black sand; oil stains black wood at ~7.0	X		. 5.0-6.0	-	-		<u> </u>	-12	<u> </u>	-	┷	1_	X							\perp	\perp	\Box
LB-11	Former Lever Bros.	6	20	9,5	11.0	1,5	dark grey to black cinders				1-	-	-	-	-	-	-	—	₩	\sqcup	\vdash	\perp	_		\bot	\perp	\perp	\perp	
LB-18	Former Lever Bros.	6	16	4.0	8.0	4.0	intermittent cinders w/ gravel, sand; black	X		3.5-4.0	╁	\dashv	-+	+	٠,	,	-	+-	1	1,,,	1	+	\vdash	\sqcup	-	+	+		+1
LB-21	Former Lever Bros.	6	10	2.5	3.5	1.0	trace cinders	X		2.5-3.0	╅╾┥	-	-	+	+5	_	+-		1 ×	X		+	╄		+	+	+		+
LB-24	Former Lever Bros.	6	13	2.5	12.5	10.0	black fill w/ cinders	X		4.0-4.5	1		+	+	-1;	}	+		1 ^		x	+-	+-			+		+	+
LB-25	Former Lever Bros.	6	12	0.0	4:5	4.5	trace cinders	X	-	4.5-5.0	┨─┤		+	+	-1:	-		_	-	1	<u> </u>	-	-	1		$\perp \perp \mid$		_	\perp
LB-26	Former Lever Bros.	6		4.0	12.0	8.0	cinders w/in black fill and sand	X			-				-12	4	_		X		X	<u> </u>						1	
LB-27	Former Lever Bros.	6	13	5.0	12.0	7.0	cinders with black fill and sand	X		4.0-4.5		-	+	4)	4	-	X	<u> x</u>	X	X		\perp		\perp	\Box	\perp		
LB-4	Former Lever Bros.	6	16	3.5	4.0	0.5	moist brick and cinders	X		3.5-4.0	+		-	+	٠	+	+	₩	₩	x		+	-	-		\perp	_	+	\perp
LB-8	Former Lever Bros.	6	20	8.5	16.0	7.5	dark brown to black cinders, 2" cinder layer at 12'			0.5-4.0	1	-+	+	+		╁	+	1~	 ≏	 ^ 		+	╁	-	-	+	_	+	+
MW-29	Former Lever Bros.	6	8	5.0	6.0	1.0	black fill w/ cinders, sand	X		4.5-5.0	+	\neg		-	-13	+	+-	+	Y	x	v-	+	┼-		+-	+		+	+
MW-31	Former Lever Bros.	6	12	8.0	8.0	trace	black "cola-like" material					_	\neg	- -	- ^	` -	+	+	Ĥ	1		+-	+-	-	+	+-	+	+	+
MW-6 MW-7	Former Lever Bros.	6	5	5.0	5.0	trace	trace black cinders at ~5.0					\neg	\top	\top	\top	\top	+	1		Н	_	+	1	+	+-	+	_	+	+
MW-120B	Former Lever Bros. Former Lever Bros.	6 1	20 19	3.0-4.0'	3.0	4.0	black-brown cinders w/ clay, gravel										\top					\top		\dashv	+		+	+-	+1
MW-120B	Former Lever Bros.	1	15	3.16 6.25	13.0 7.0	9.8	clayey silt w/ cinder/slag; dark brown	X		3.5-4.0		\perp	_ [:	x L	- >				X	X	X	\top				+		X	(X
GZ45-MW40	Former Lever Bros.	5	6	2.0	4.0	2.0	fine sand w/ crushed brick, cinder/slag/fill some wood fragments w/in fill				\sqcup	_			1													_	\Box
GZA-1	Former Lever Bros.	5	2	0.5	2.0	1.5	trace coal slag fragments				1	\rightarrow	-	+	_	- -	╀-	1	\perp	\sqcup	_	\bot						\perp	
GZA-1A	Former Lever Bros.	5	8	0,5	0.5	trace	little coal slag				+		+	-		+	-	₩	<u> </u>	\vdash		-	1	_		\bot	_	\bot	\bot
GZA-30	Former Lever Bros.	5	20	2.0	10.0	8.0	little coal and cinders w/in fill; petroleum-like odor, sheen	X		7.0-7.5	1-	-+	+	+	+	-	+-	+	-	X	$\overline{}$	+-	-	-	+	+	+	 - -	\bot
SB-28	Block 93	1	10	2.9	7.5	4.6	black fine angular gravel little cinder/slag	X		2.9-3.9	1-	\dashv	+		+		1x	+	1~	1	- -	+-	╅┯	x	┵	+	+	+-	+
	Block 93	· 1	10	2.9	7.5	4.6	black fine angular gravel and coarse sand trace cinder/slag	х		5.6-7.0	П	1		\top	,	1	x	П		П	\top	\top	x	7	7	H	+	+	H
SB-30	Block 93	1	20 .	4.0	15.0	11.0	dark grey coarse sand, little fine sand and gravel, trace brick, trace slag; coal tar	х		4.0-15.0	П	1	7	\top	,		x	Н		П	\top	\dagger	х	1	+	H	+	+	\forall
SB-31	Block 93	1	15	4.5	7.5	3.0	black gravel, little cinder/slag	X		4.5-7.5	1	$^+$	+	+	1×	1	X	1	Н	\vdash	+	+	X	+	+	+	+	+	+
SB-34C	Former Lever Bros.	1	5	0.9	1.6	0.7	black mix of brick, gravel, silt and sand, trace/little cinder/slag	х		0.9-1.6			T		Tx	1	х		П	П	T	\top	x	x	x	\Box	1	\dagger	\forall
SB-36	Quanta	1	10	5.9	6.7	0.8	black fine sand, little coal, gravel, coarse sand, brick and cinder/slag	x		5.9-6.7		T	\top	\top	×		×		П	П	十	+	х	+	十	\Box	\top	+	\forall
SB-36	Quanta	1	10	1.2	5.2	4.0	dusky red/ very dusky red fine to coarse sand and gravel	X	Х	1.2-2.2			\top	1	+	+	1		\vdash	 	+	+	1x	x :	x I	+	+	+	+-1
SB-37	Quanta Quanta	1	10	1.2	5.2	4.0	dusky red/ very dusky red fine to coarse sand and gravel	Х	X	3.2-5.2				I	X		X			\sqcap	\top	+	X	٦,	1		+	+	+
			11	3,9	5.0	· 1.1	very dusky red medium sand, little cinder/slag	X	Х	3.9-5.0	П	T	I	T	X	T	X	П			\perp	T	X					\perp	\Box
SB-38	Quanta Quanta	1	10	1.7	7.3	.5.6	very dark brown grading to reddish brown fine sand, little coarse sand and gravel	х	х	1.7-3.4		1			×	`	x						x	x :	×				П
· · · · · · · · · · · · · · · · · · ·	Quanta	1	30	1.7	7.3	5.6	dark red coarse sand and gravel, trace silt, coal tar	X	Х	3.4-7.3		\Box	T	I	X		X				\perp	I	X	\neg			\perp	+	+1
		 										_	1	-[F	1	ш	J	\Box	\perp	\perp			\perp		\perp	I	\square
											ı	- 1	ı	-	1		1	1 1	!	ıΕ	- 1		1		F		1		

Summary of Cinder/ Coal/ Ash/ Slag and Reddish-Purple Soil Visual Observations and Samples

Cummary or on	den odan Asin Slag	and Reddis	ir-r diple 30ii	VISUAL ODSELV
Property	# of Locations where Cinder/ Coal/ Ash/ Slag or Reddish-Purple Soils Observed	# of Locations where Reddish- Purple Soil Observed	# of Samples	# of Samples of Reddish-Purple Soil Intervals
115 River Road,				
LLC	5	0	6	
Block 93	25	0	26	0
Edgewater	25	10	9	4
Former Lever Bros.	32	0	19	. 0
Quanta	31	7	31	9
Total:	118	17	91	13

Notes:
UNK - Unknown
NA - Not Available
NA - Not Applicable
Consultant Reference:
1. CH2M HILL
2. Environ
3. Environmental Waste Management Associates
4. GeoSyntec
5. GZA
6. Langan Engineering
7. TRC Raviv Associates, Inc.

Table 9
Summary of All Samples Collected To Date
Characterization of Cinder/ Ash and Reddish-Purple Soils
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

		NJDEP So Crit	oil Cleanup eria	USEPA Reg	ion 9 PRGs	¹ NJDEP	Historic Fill	Database		s Known to C h/ Slag/ Coal	ontain Cinder/ (70)		es Visually (sh-Purple C	
Parameter		Non- Residential	Residential	Industrial	Residential	Minimum	Maximum	Average	Minimum Detected Value	Maximum Detected Value	Geometric Mean	Minimum Detected Value	Maximum Detected Value	Geometric Mean
ALUMINUM	(49)	N/A	N/A	76000	100000				938	18300	5354	300	6670	1712
ANTIMONY	(56)	340	14	410	31				1.2	79	2.5	1.23	229	46.1
ARSENIC	(82)	20	20	1.6	0.39	0.05	1098	13.2	0.002	988	28	349	5870	1385
BARIUM	(49)	47000	700	67000	5400				15	710	88	-29.8	1150	259
BERYLLIUM	(56)	2	2	1900	150	0.01	79.7	1.23	0.10	5.8	0.32	0.56	0.6	0.19
CADMIUM	(56)	100	39	450	37	0.02	510	11.1	0.12	12.0	0.50	0.30	10	1.8
CALCIUM	(49)	N/A	N/A	N/A	N/A				1090	62400	9735	264	47700	3933
CHROMIUM	(62)	N/A	N/A	450	210				5.5	84.0	20.2	1.8	105	8.9
COBALT	(49)	N/A	N/A	1900	900				2.0	32.4	7.4	2.42	70	19.1
COPPER	(56)	600	600	41000	3100				10.2	657	91 .	46.3	6170	963
RON	(49)	N/A	N/A	100000	24000		- 1		3320	83900	19333	24100	294000	106443
LEAD	(80)	600	400	800	400	0.28	10700	574	10.8	12200	161	257	38800	3020
MAGNESIUM	(49)	N/A	N/A	N/A	N/A				192	7350	1810	36	1250	227
MANGANESE	(49)	N/A	N/A	20000	1800				21	987	148	20.1	226	56
VICKEL	(56)	2400	250	20000	1600				5.2	1100	24.6	2.6	118	8.1
POTASSIUM	(49)	N/A	N/A	N/A	N/A				128	1800	578	285	3910	903
SELENIUM	(56)	3100	63	5100	390				0.51	28	1.6	2.46	302	15.4
SILVER	(56)	4100	110	5100	390				0.15	3.5	0.50	0.36	27.1	4.8
SODIUM	(49)	N/A	N/A	N/A	N/A				327	2930	348	340	4800.0	700
THALLIUM	(55)	2	2	68	5				0.25	4.8	0.70	0.48	84	10.2
/ANADIUM	(49)	7100	370	1000	78				3.5	70.0	24.0	2.0	54	11.9
ZINC	(56)	1500	1500	100000	24000	2.45	10900	575	25	1000	163	15.5	3820	341
CHROMIUM III	(16)	N/A	N/A	450	210				6.7	84	19.9	7.7	105.0	10.2
HEX. CHROMIUM	(32)	N/A	N/A	450	210				0.56	0.6	1.2	ND	ND	0.71
MERCURY	(55)	270	14	310	23				0.02	13.2	0.65	0.13	69	4.2

Notes:

Numbers in parentheses () indicate the total number of samples for each analyte or category

N/A: Not Available

^{1:} Values taken from Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005).

^{2.} Samples collected during the June 2007 Soil Sampling Event where cinder, ash, slag, or coal was not visually observed in the field were later confirmed to contain significant amounts of black, glassy slag. These samples are included in this data sets despite the fact that in some cases they were observed directly above or below intervals of reddish-purple soil.

^{3:} These samples include those that were taken from discrete intervals where reddish-purple, or dusky red discolored soils were visually observed in the field.

Values highlighted in **bold and italics** are at or above residential and/or industrial values for NJDEP Soil Cleanup Criteria or USEPA Region 9 Preliminary Remediation Goals (PRGs) For samples where constituents were not detected (ND), 1/2 of the detection limit was used for calculations

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm)

Table 10
Statistical Comparison of Black/Brown Slag-Rich Fill and Reddish-Purple Soils
Characterization of Cinder/ Ash and Reddish-Purple Soils
Quanta Resources Superfund Site, OU1
Edgewater, New Jersey

Wales of			Shapiro-Wilks T	est for Normality a		E	Equality of Variance	e ab			Backg	round Compariso	n a,c
Inorganic	Туре	Untransformed Data Normal?	p-value	Log-transformed Data Normal?	p-value	Equal Variance?	F Value	p-value	Mann-Whitney Statistic	p-value	t Value	p-value	Significantly Different?
Aluminum	Brown/Black Slag-Rich Fill	No	0.01481186	No	0.01299926				25	0.00261048			V 01 11 11
	Reddish-Purple Soils	Yes	0.0935318	Yes	0.55600865				25	0.00261048			Yes; Slag-Rich Fill greater
Antimony	Brown/Black Slag-Rich Fill	No	2.0264E-08	No	0.01732947				40	0.00536629			V - D - I - I - I - I - I - I - I - I - I
	Reddish-Purple Soils	No	0.00055339	Yes	0.90920939				40	0.00530029			Yes; Reddish-Purple Soils great
Arsenic	Brown/Black Slag-Rich Fill	No	4.7391E-14	No	3.4229E-07				4	2.3642E-05			Vac Baddat B. Ja C. II
	Reddish-Purple Soils	Yes	0.09750767	Yes	0.71528767					2.5042E-05			Yes; Reddish-Purple Soils gre
Barium	Brown/Black Slag-Rich Fill	No	9.54E-07	Yes	0.81170957	Yes	1.17401975	0.91601001			-0.9563139	0.34586748	Na
	Reddish-Purple Soils	Yes	0.42704108	Yes	0.72923378						-0.0000100	0.54500748	No
Beryllium	Brown/Black Slag-Rich Fill	No	4.968E-10	Yes	0.29071036	Yes	1.65325319	0.55099636			0.9227346	0.36167819	No
	Reddish-Purple Soils	Yes	0.71115534	Yes	0.11887512						O.OZZTO-10	0.00107019	No
Calcium	Brown/Black Slag-Rich Fill Reddish-Purple Soils	No No	6.3296E-05	Yes	0.63088176	No	6.11314267	0.00076897	74	0.32230711			No
			0.02835286	Yes	0.2731844		-						No
Cadmium	Brown/Black Slag-Rich Fill Reddish-Purple Soils	No	2.3269E-10	Yes	0.08260478	Yes	1.2956213	0.57121125			-1.9493669	0.05828742	No
		No	0.02037955	Yes	0.53090292						7.0 100000	0.00020142	140
Chromium	Brown/Black Slag-Rich Fill Reddish-Purple Soils	No	0.00014659	Yes	0.87964932	No	5.74237916	0.00044318	50	0.0063127			Yes; Slag-Rich Fill greater
		No No	5.2357E-05	Yes	0.69640167	MARKET STATE			-	0.0000121			res, slag-Rich Fill greater
Chromium III	Brown/Black Slag-Rich Fill		0.00169266	Yes	0.11869738	No	7.03008042	0.0190658	14	0.45934179			No
	Reddish-Purple Soils	Yes	0.10522104	Yes	0.7914572		Programme St.			0.10001110			No
Cobalt	Brown/Black Slag-Rich Fill	No	0.00212548	Yes	0.66749381	No	5.38937298	0.00181042	56	0.08327414			No
	Reddish-Purple Soils	Yes	0.48922026	Yes	0.07195313					0.00027414			No
Copper	Brown/Black Slag-Rich Fill Reddish-Purple Soils	No Yes	0.0058937	No	0.04815368				48	0.0119293			Yes; Reddish-Purple Soils gre
			0.4143945	Yes	0.08274199					0.0110200			res, Reduisi-Fulple Soils gre
Iron	Brown/Black Slag-Rich Fill	No	0.00160294	No	2.2518E-11				26	0.00298768			Yes; Reddish-Purple Soils gre
	Reddish-Purple Soils	Yes	0.06600032	Yes	0.25590905				A. T. S. H. L.	0.00200700			res, Reduisti-Fulple Soils gre
Lead	Brown/Black Slag-Rich Fill	No	1.8071E-08	No	1.8824E-11				60	0.00228408			Yes; Reddish-Purple Soils gre
	Reddish-Purple Soils	No	0.00030582		0.57914884				00	0.00220400			res, Reddish-Purple Solls gre
Mercury	Brown/Black Slag-Rich Fill	No	3.8865E-08	THE RESIDENCE OF THE PARTY OF T	0.65808893	Yes	2.08409795	0.16383611		25	-2.2008642	0.03373246	Yes; Reddish-Purple Soils great
	Reddish-Purple Soils	No	0.00062286	Yes	0.9119681						2.2000042	0.03373240	res, Reduisir-Purple Soils grea
Potassium	Brown/Black Slag-Rich Fill	Yes	0.08255504	CONTRACTOR OF THE PARTY OF THE	0.50665026	Yes	1.34764127	0.54210572			-1.0211638	0.31460506	No
	Reddish-Purple Soils	Yes	0.0904691	THE RESIDENCE OF STREET, STREE	0.78748677						1.0211000	0.51400500	No
Manganese	Brown/Black Slag-Rich Fill	No	2.9153E-06		0.27120191	Yes	1.02642049	1			2.68519792	0.01125323	Yes; Slag-Rich Fill greater
	Reddish-Purple Soils	No	0.0287512		0.84458885	Name and Address					2.00010102	0.01120325	res, Slag-Rich Fill greater
Magnesium	Brown/Black Slag-Rich Fill	No	0.00155581		0.04808964			學學是有	17	0.00083758			Yes; Slag-Rich Fill greater
	Reddish-Purple Soils	Yes	0.24195239		0.39277178				The state of the s	0.00000700			res, slag-Rich Fill greater
Nickel	Brown/Black Slag-Rich Fill	No	7.8317E-12		0.00207739				41	0.00595156			Yes; Slag-Rich Fill greater
	Reddish-Purple Soils Brown/Black Slag-Rich Fill	No No	2.7593E-05 4.4144E-06	Yes	0.2584965								res, Slag-Ridi Fill greater
Sodium		Yes			0.98473659	Yes	1.46586137	0.66926035			-1.5173871	0.13869152	No
25.24.26.20	Reddish-Purple Soils Brown/Black Slag-Rich Fill	No	0.37842966 1.8354E-10		0.68010482							5.70000 T3E	140
Selenium	Reddish-Purple Soils	No	1.8354E-10 1.9699E-05	The same of the sa	0.07173901	No	3.31166947	0.02247839	26.5	0.00119653			Yes; Reddish-Purple Soils grea
	Brown/Black Slag-Rich Fill	No	0.00452152	Yes	0.11295668			No.					. es, reddisir-i dipie dolls grea
Silver	Reddish-Purple Soils	No	0.00452152		0.0022412				81	0.16133629		30.000	No
	Brown/Black Slag-Rich Fill	No	7.0795E-09		0.01869401								NO
Thallium	Reddish-Purple Soils		0.14272546		0.00056666				27.5	0.00152432			Yes; Reddish-Purple Soils grea
	Brown/Black Slag-Rich Fill		0.14272546	THE RESERVE AND ADDRESS OF THE PARTY OF THE	0.23549889						CHALL		. 25, reductivit diple 30lls grea
Vanadium	Reddish-Purple Soils		0.02516506	THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	0.08930724	Yes	2.67004311	0.07279624			2.74102017	0.00981074	Yes; Slag-Rich Fill greater
	Brown/Black Slag-Rich Fill	No	1.3483E-05	THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TW	0.85261184								1 50, Oldy That Fill greater
Zinc	Reddish-Purple Soils	Yes	0.0512526		0.38075098	No	4.55601188	0.00343315	94	0.33612016			No
and the state of t	Reduish-Pulple Solls	res	0.0012026	Yes	0.6777497								140

Non-detects were included at 1/2 the detection limit

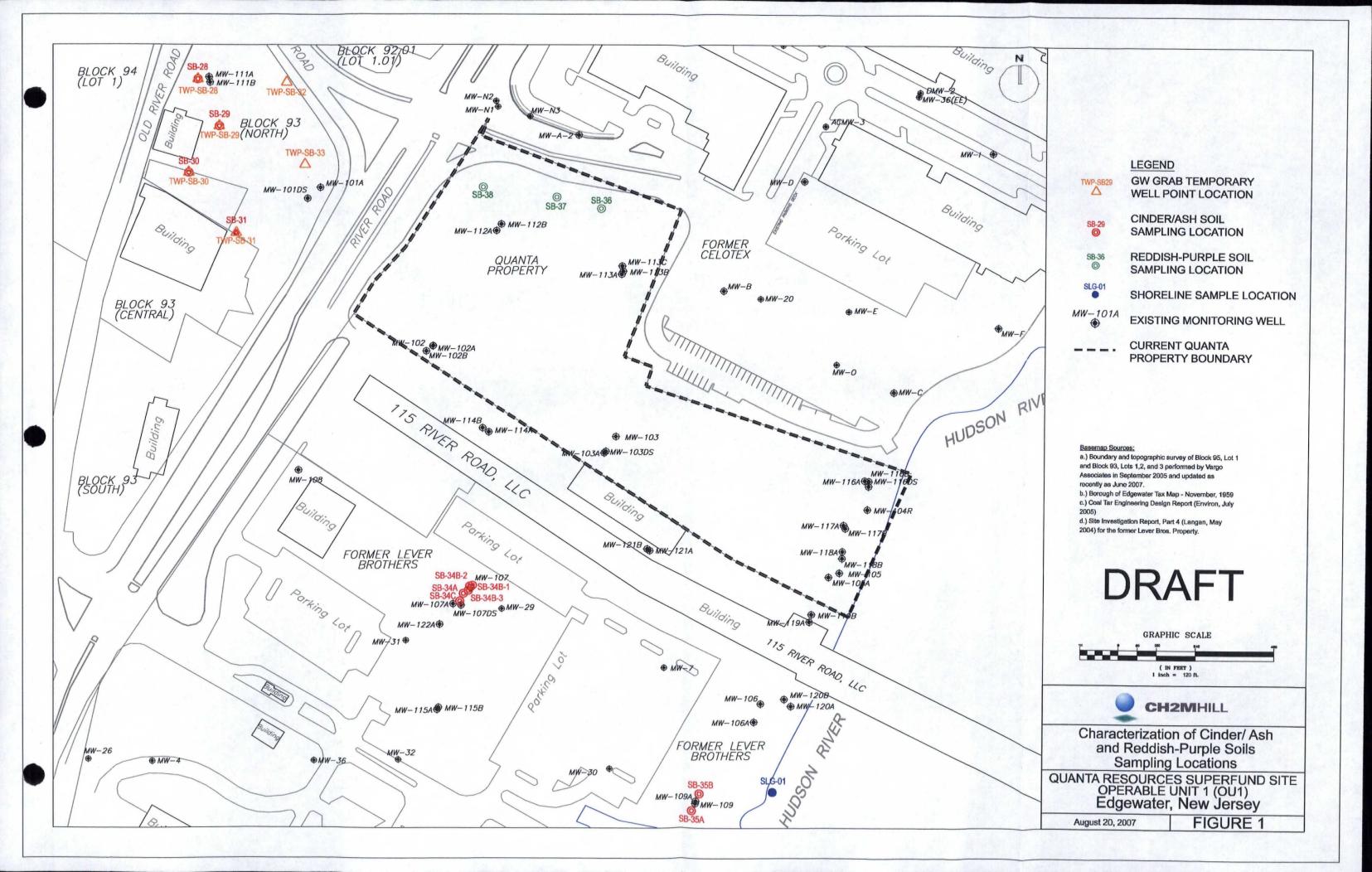
= Data (untransformed or transformed) used for comparions; data with closest approximation to normal distribution and greatest equality of variance (based on p-values) selected; Untransformed data used for non-parametric tests.

= Test not performed

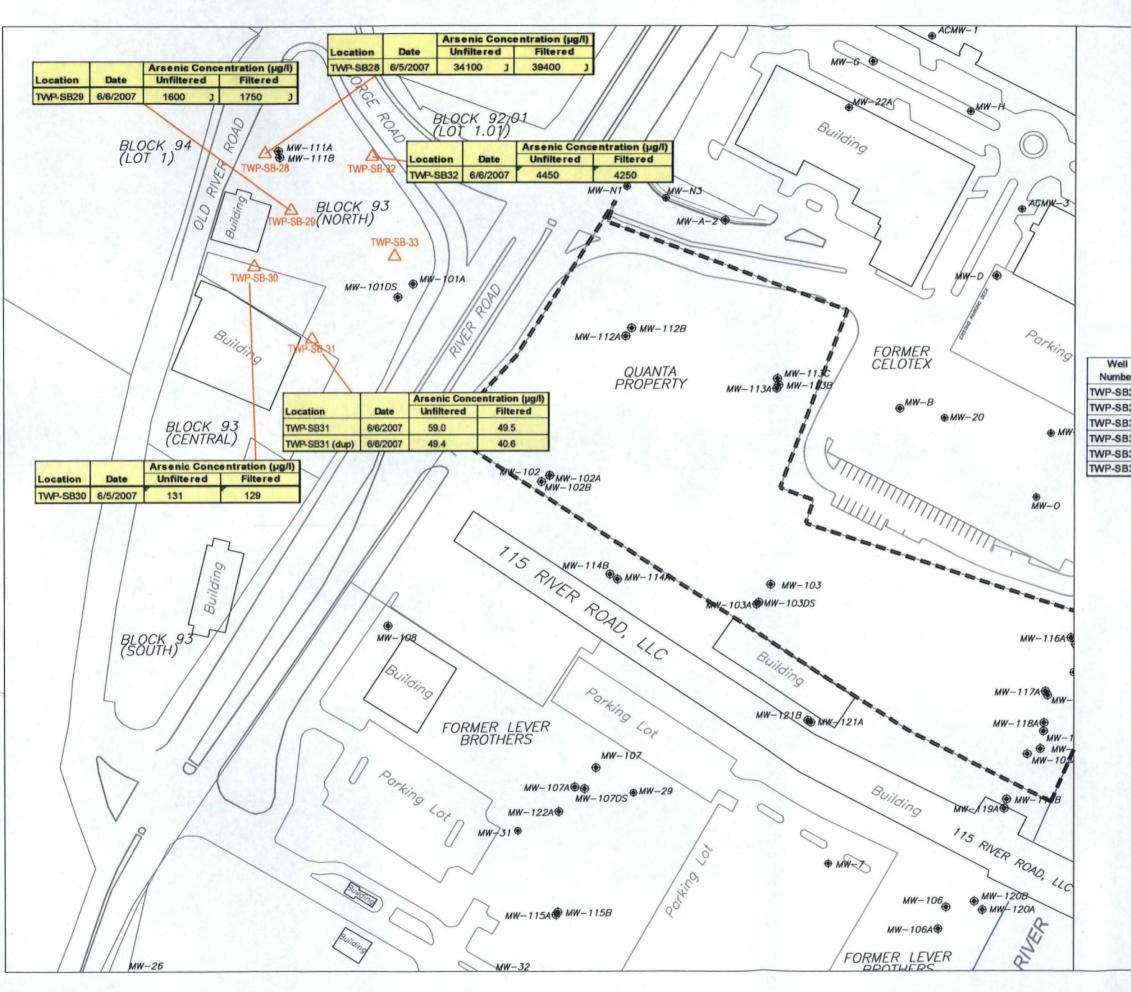
 a p-values were considered significant at p ≤ 0.05

^b An equality of variance test was performed only if both data sets had normal distributions

^c A t-test comparison was made only if both data sets were normal and had equal variances, otherwise a non-parametric Mann-Whitney rank-sum test was performed









LEGEND

TWP-SB29

GW GRAB TEMPORARY WELL POINT LOCATION

MW-101A EXISTING MONITORING WELL

_ _ _ CURRENT QUANTA
PROPERTY BOUNDARY

GROUNDWATER FIELD PARAMETERS

Well Number	рН	Temp.	Cond. (mS/cm)	ORP (mV)	DO (mg/L)	LaMotte Turb. (NTU)	Comments
TWP-SB28	6.69	21.67	0.033	-150.1	0.99	38.7	Clear/None
TWP-SB29	6.67	18.31	6.819	-171.9	1.07	13	Clear/None
TWP-SB30	6.83	17.89	0.018	-180.8	0.17	116	Clear/None
TWP-SB31	7.25	15.09	0.43	-182	4.02	19	Clear/None
TWP-SB32	7.13	15.81	1.604	-180.8	2	17.3	Clear/None
TWP-SB33	8.02	18.96	1.212	120.7	1.95	12	Clear/None

Basemap Sources:

- a.) Boundary and topographic survey of Block 95, Lot 1 and Block 93, Lots 1,2, and 3 performed by Vargo Associates in September 2005 and updated as recently as June 2007.
- b.) Borough of Edgewater Tax Map November, 1959 c.) Coal Tar Engineering Design Report (Environ, July
- d.) Site Investigation Report, Part 4 (Langan, May 2004) for the former Lever Bros. Property.

DRAFT

GRAPHIC SCALE

to the state of

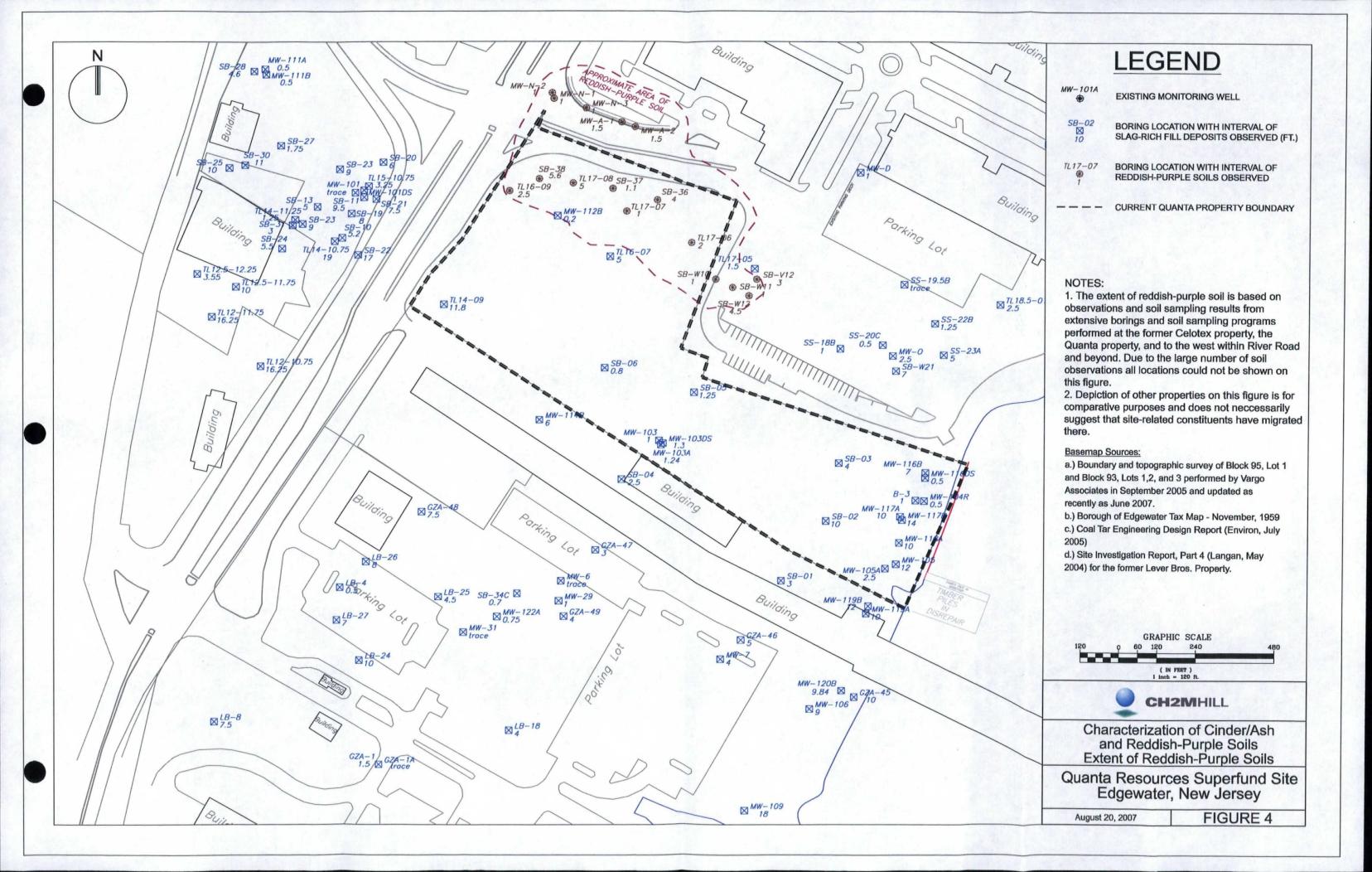

CH2MHILL

Characterization of Cinder/ Ash and Reddish-Purple Soils Groundwater Data Results

QUANTA RESOURCES SUPERFUND SITE OPERABLE UNIT 1 (OU1) Edgewater, New Jersey

August 20, 2007

FIGURE 3



HISTORIC FILL OF THE CENTRAL PARK QUADRANGLE 2004 APPROXIMATE EXTENT OF STUDY AREA GUTTENBERG, NEW YORK, RESERVOIR SCALE 1:24 000 MILE 7000 FEET 1 KILOMETER CONTOUR INTERVAL 20 FEET NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

The "Brownfield and Contaminated Site Remediation Act" (N.J.S.A. 58:10B-1 et seq.) requires the Department of Environmental Protection to map regions of the state where large areas of historic fill exist and make this information available to the public. This map shows areas of historic fill covering more than approximately 5 acres. For the purposes of this map, historic fill is non-indigenous material placed on a site in order to raise the topographic elevation of the site. No representation is made as to the composition of the fill or presence of contamination in the fill. Some areas mapped as fill may contain chemical-production waste or ore-processing waste that exclude them from the legislative definition of historic fill

Fill was mapped from stereo aerial photography taken in March 1979, supplemented in places by planimetric aerial photography taken in the spring of 1991 and 1992. Additional areas of fill were mapped by comparing areas of swamp, marsh, and floodplain shown on archival topographic and geologic maps on file at the N. J. Geological Survey, dated between 1840 and 1910, to their modern extent. In a few places, fill was mapped from field observations and from drillers' logs of wells and borings.

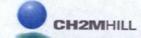
Most urban and suburban areas are underlain by a discontinuous layer of excavated indigenous soil mixed with varying amounts of non-indigenous material. This material generally does not meet the definition of historic fill and is not depicted on this map. Also, there may be historic fills that are not detectable on aerial photography or by archival map interpretation and so are not shown on this map, particularly along streams in urban and suburban areas.

Use of the maps related to the Technical Rules, N.J.A.C. 7:26E

This map is provided for informational purposes only. The use of this map as the only source of information regarding the presence of historic fill at a site does not fulfill the diligent inquiry requirements of the Preliminary Assessment set forth at, N.J.A.C. 7:26E-3.1(c). This map may be used as one source of information to fulfill the requirements of the Site Investigation at, N.J.A.C. 7:26E-3.12. This map is not intended to fulfill the Remedial Investigation requirements associated with historic fill at, N.J.A.C. 7:26E-4.6(b).



Map Source: NJDEP Land Use Management and New Jersey Geological Survey, Historic Fill of The Central Park Quadrangle, Historic Filling Map (HFM-43)



NJDEP Historic Filling Map

Quanta Resources Superfund Site Edgewater, New Jersey

August 21, 2007

FIGURE 5



					<u> </u>										
	CT NAME: _		Quanta						SURFACE ELEVATION: 8.8						
	TION:		Block 9						MEASURING POINT: N/A						
				.QT.Q	7. AS .	CD.03	.**		MEASURING POINT ELEVATION	v : _N/	/A ·				
	Т:		Honeyw						TOTAL DEPTH: 10 ft.						
					viron	nental :	Servic	es, Inc	FOREMAN: J Rou	isa .				-	
DRILLI	ING METHOD): _	Direct P	ush					DRILLING EQUIPMENT: Geop	robe 60	10			·	
										clerode		.			
START	DATE:		06/05/2	007					FINISH DATE: 06/05	/2007					
NORT	HING:71	919	1.85		EAS	TING:	632	578.9	APPROX. DEPTH TO WATER:	3.5 ft. b	gs @ (09:30	on 6/5/0	7	
			IES J/ft.)			SCREE		l	MATERIALS DESCRIPTION	_	BOL	WEI	L CONS	TRUCT	101
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	۵ld	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL				
	ω	0)	ш.				-			+	-		· · · ·		<u></u>
_0		D	N/A	2.5/5	N/A	ND	N/A	0	Mix of fine/silty sand and coarse, angular gravel/cobbles, very dark brown, 7.5YR, 2.5/2, dry, medium dense (FILL)			1-			-
_						62.3	N/A	-	Gravelly, fat clay, strong brown, 7.5YR, 4/6, moist, soft (FILL)			2-			
-	2.9' to 3.9' (SB- 28-3.4-060507)					ND 	N/A	-	Fine, angular gravel with little slag, black, dry, loose/medium dense (FILL)			3-	∇		
-						ND	N/A	-	Crushed concrete (FILL)			4-	=		
-5						ND	N/A	5	Silt, some angular gravel, very dark brown, 7.5YR, 2.5/2, moist, very soft (FILL)			5-		\$	
_	5.6' to 7.0' (SB- 28-6.3-060507)	D	N/A	1.9/5	N/A	ND	N/A		Fine, angular gravel/coarse sand, trace silt, trace slag, black, saturated, dense (FILL)	0000		6-			
								-				7-			
_						ND	N/A		Clayey silt, some organic material, very dark brown, 7.5YR, 2.5/2, moist/saturated, soft (CLAYEY SILT)	-: I	ML	8-			
								,	,			9-	Ŀ	 (
— 10 -		-						-10	Bottom of boring @ 10 ft. bgs	<u> </u>		10-		<i>.</i>	
bgs = I ND = r NM = i	END: mean sea level below ground surface not detected not measured not applicable	<u> </u>	SAMPL D: driv W: was ST: She A: Aug HA: har C: core RC: rota	e shed elby Tub ger nd auge ed	oe r	SOIL: G MOISTU dry moist wet PROPO	JRE: RTION	0-4: 5-10 11-29 30-4: 50+:	loose 3-4: soft 2: medium dense 5-8: medium soft 9: dense 9-15: stilf very dense 16-30: very stiff S0: hard Density designation based on blow Density designation based on blow	060507(2. trography 060507 (5	y, XRD i.6-7.0): esignatio	TAL Me	etals, TOC,		



Ĺ					<u> </u>				
PROJ	ECT NAME:		Quanta	Reso	urces	3			SURFACE ELEVATION: 6.3 ft. MSL
	TION:		Block 9						MEASURING POINT: N/A
PROJ	ECT NUMBER	₹:	332898	3.QT.Q	7.AS	.CD.03			MEASURING POINT ELEVATION: N/A
CLIEN	NT:		Honeyv	vell					TOTAL DEPTH: 15 ft.
DRILL	ING CONTRA	CTO	or: S	GS En	viron	mental :	Servic	es, In	c. J Rousa
DRILL	ING METHO): _	Direct F	Push					DRILLING EQUIPMENT: Geoprobe 6010
SAMP	LING METHO	D: _	5 ft. ma	crocor					CH2M OBSERVER: A Harclerode
STAR	T DATE:		06/05/2	007					FINISH DATE: 06/05/2007
NORT	THING: 71	904	5.10						APPROX. DEPTH TO WATER: 2.71 ft. bgs @ 10:30 on 6/6/07
			ES (SCREE		}	MATERIALS DESCRIPTION 💆 WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	Old	FID	ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing WELL CONSTRUCTION WELL CONSTRUCTION WELL CONSTRUCTION WELL CONSTRUCTION WELL CONSTRUCTION ON TO SERVICE OF THE PROPERTY
_0								0	
	0.8' to 2.9'	D	N/A	3.0/5.0	N/A	ND ND	N/A N/A		Mix of fine/silty sand and coarse, angular gravel/cobbles, and asphalt, black, dry, medium dense (FILL)
_	(SB- 29-1.9-060507)					ND	N/A	_	Clean, medium sand, light brown, 7.5YR, 6/3, dry, medium dense (FILL)
		-				ND	N/A	-	Sandy silt, trace small angular gravel, very dark brown, 7.5YR, 2.5/2, and some reddish black 2.5YR, 2.5/1, dry/moist, dense (FILL)
-5	5.0' to 8.4'	D	N/A	1.6/5.0	N/A	ND	N/A	— -5	Coarse sand, trace fine gravel, some brick, black and red, moist to saturated with depth, medium dense (FILL)
<u>.</u>	(SB- 29-6.7-060507)	,						_	Fine/medium gravel, some brick, black and red, saturated, loose (FILL)
-			;					-	8- 8-
						ND .	N/A	<u>.</u> _	Hard, semi-plastic tar, black, moist, very dense (FILL)
10		D	N/A	2.3/5.0	N/A	ND	N/A	-10	Soft tar with some fabric-like material, black, wet, loose/soft, obvious product odor (FILL)
-						ND	N/A	- -	Organic silt with some peat, very dark brown, 7.5YR, ML 11 11 ML 11 12 -
								-	13-
-									14-
- 15									Bottom of boring @ 15' bgs
		<u> </u>							OILS DENSITY: DI ASTIC SOILS DENSITY: NOTES:
msl = bgs =	END: mean sea level below ground surface		SAMPL D: driv W: was ST: She A: Au	re shed elby Tub		MOISTU dry moist		0-4: 5-10 11-2	Very loose
NM =	not detected not measured not applicable		HA: har C: cor RC: rota	nd auge ed	.	PROPO Trace: <	5% F	50+: IS: ew: 16	: very dense 16-30: very stiff 30: hard Density designation based on blow ROCK: RQD (rock quality designation):



PROJI	ECT NAME: _		Quanta	Reso	urces				SURFACE ELEVATION: 7.8 ft. MSL
	TION:		Block 9						MEASURING POINT: N/A
PROJI	ECT NUMBER	R: _	332898	.QT.Q	7.AS	.CD.03			MEASURING POINT ELEVATION: N/A
CLIEN	IT:		Honeyw	vell					TOTAL DEPTH: 20 ft.
DRILL	ING CONTRA	CTO	OR: S	GS En	viron	mental	Servic	es, Ind	c. J Rousa
	ING METHOD								DRILLING EQUIPMENT: Geoprobe 6610
					e sar				CH2M OBSERVER: D Finney
	T DATE:								FINISH DATE: 06/05/2007
NORI	HING:	911	7.90		EAS	STING:	032	.012.1	2 APPROX. DEPTH TO WATER: 4.0 ft. bgs @ 13:00 on 6/5/07
Ì			ES.			SCRE		1	MATERIALS DESCRIPTION d WELL CONSTRUCTION
<u>@</u>	No.		LOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)		"		EVATION (ft. MSL)	MATERIALS DESCRIPTION SOLUTION MELL CONSTRUCTION SOLUTION
(FT. BGS)	SAMPLE OR RUN DESIGNATION	ᆔ) NO	\ 8			-	(#	
Ē.	OR	SAMPLE TYPE	BLOWS PER or CORE RU	FRY				NO.	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors
DEPTH	PLE I DE	13	SWS GO	SE				VAT	ROCK: rock type, color, hardness, major mineral
빌	SAN	SAN	P.O.	Ä	P.G.	읎	GF	H	ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
_0	,	D	N/A	2.3/5.0	N/A	ND	N/A	_0 .	Fire send and fire angular group of the send of the se
_			170	2.3/3.0	177	IND		-	Fine sand and fine angular gravel, reddish brown, 5YR, 4/4, dry (FILL)
_	1.5' to 3.5'	1				ND	N/A		Very fine sand and angular gravel, dark grey 10YR,
	(SB- 30-2.5-060507)					-			4/1, moist, medium dense (FILL)
-		-	l.,						Coarse sand, little fine sand and gravel, some plastic tar, trace brick, trace slag, dark grey, 10YR,
-	4.0' to 15'			-		ND	N/A	<u> </u>	4/1, moist, medium dense, sheen on groundwater
-5	(SB- 30-9.5-060507)			ļ <u>.</u>				5	(FILL)
_	}	D	N/A,	1.4/5.0	N/A	, ND	N/A		Fine gravel/coase sand, some medium sand, little silt, trace slag, dark grey, 10YR, 2/1, saturated
						`			(FILL)
-								· .	
_		ļ	·			ŀ		-	8- 8-
_	٠							-	
— 10								-10	
_ 10		D	N/A	1.3/5.0	N/A	ND	N/A	-10	Same as above with black liquid tar from
-			•					-	approximately 10-12' bgs (FILL)
-								-	12-
-		ŀ	1	Ì		ļ		_	
					•		ĺ		
-									
15		D	N/A	4.0/5.0	N/A	59.8	N/A	15	Meadow mat (CLAYEY PEAT) 15-
								_	16-
_								_	17
_									
									18-
-			^						
- 20				-				20	20-
-			·						Bottom of boring @ 20 ft. bgs
			<u> </u>		Ľ,	<u></u>		,	
LEGE			SAMPL D: drive		S:			AR SC	DILS DENSITY: PLASTIC SOILS DENSITY: NOTES: very loose 0-2: very soft SB-30-2.5-060507(1.5-3.5): VOCs, SVOCs, TAL Metals,
	mean sea level below ground		W: was	hed	<u>,</u>	MOISTL dry	JHE:	5-10:	1 loose \ 3.4: soft \ 100se \ 5-8: medium soft \ SB-30-9:5-060507 (4.0-15): TAL Metals, TOC, Petrography, XRD
	surface not detected		A: Aug	er	- 1	moist wet		30-49	9: dense 9-15: stiff XRD
	not measured not applicable		HA: han	ed .	- 1	PROPO		S:	>30: hard Density designation based on blow RQD (rock quality designation):
	- -		RC: rota	sonic c	ore	Trace: < Little: 6-	5% Fe	w: 16-3	30% counts for each 12" of penetration reported in % = [length of core in pieces 4"



PROJ	ECT NAME: _		Quanta	Resou	ırces	;			SURFACE ELEVATION: 5.4 ft. MSL
LOCA	TION:		Block 9	3 Norti	h		'		MEASURING POINT: N/A
PROJ	ECT NUMBER	₹: _	332898	3.QT.Q					MEASURING POINT ELEVATION: N/A
	IT:		Honeyv						TOTAL DEPTH: 15 ft.
			ne. S	GS Env					nc. FOREMAN: J Rousa
	ING METHOD								DRILLING EQUIPMENT: Geoprobe 6010
									CH2M OBSERVER: A Harclerode
	T DATE:								FINISH DATE: 06/05/2007
NORT	HING:	895	0.91		. EAS	STING:	632	030.3	30 APPROX. DEPTH TO WATER: 5.4 ft. bgs @ 13:00 on 6/6/07
[. , ,	. •	<u> </u>	(n ¬	<u> </u>		SCREE	NING		MATERIALS DESCRIPTION .
	Ž.		LOWS PER 6 INCHES or CORE RUN (time/ft.)	ı F		DA.	TA I	SL)	M M M M M M M M M M M M M M M M M M M
(FT. BGS)	SAMPLE OR RUN DESIGNATION	ш	9 E Z	RECOVERY/ PENETRATION (FT.)				ELEVATION (ft. MSL)	
H. FI	OR	SAMPLE TYPE	BLOWS PER or CORE RU	ATIC		ŀ		NO O	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors
	PLE	밀	WS	OVE				VATI	ROCK: rock type, color, hardness, major mineral
рЕРТН	NOR NOR	SAM	BLO or 0	P.E.	Rab	음	윤		ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
- -	0,	1 .		†					
_0						ļ		_ 0 .	0
	0.0' to 2.2' (SB-	D	N/A	2.2/5.0	N/A	ND .	N/A		Mix of fine/silty sand and coarse, angular gravel/cobbles, very dark brown, 7.5YR, 2.5/2, dry,
-	31-1.1-060507)					ND	N/A	-	medium dense (FILL)
						"	''''		
		1				ND	N/A		
-				1.				-	3-
						1.6	N/A		
<u> </u>		ŀ	•			0.7	N/A	Ť.	Soft, plastic tar, black, moist, very soft (FILL)
-5	4.5' to 7.6' (SB-	L		<u> </u>	ļ			-5	Gravel with little slag, black, saturated, loose (FILL)
	31-6:0-060507)	D	N/A	2.3/5.0	N/A	0.1	N/A		Same as above but with some soft, plastic tar (FILL)
}						4.4	N/A	<u> </u>	
						2.8	N/A		
-						ND	N/A	t	Clayey, oranic peat/native, very dark brown, 7.5YR, 2.5/2, moist, soft (CLAYEY PEAT)
						1.2	N/A		
- 10		<u>-</u>	N/A	2.5/5.0	N/A	1.1	N/A	-10	· · · · · · · · · · · · · · · · · · ·
			17/2	2.3/3.0	1.00		1		Same as above (CEATETT EAT)
-				İ				-	
†									
								Ļ	14-
	·			•					
15		-	 	ļ	├		<u> </u>	-15	5 Bottom of boring @ 15 ft. bgs
					1			L	Bottom of borning @ 15 it. bgs
Ī					.				10-
	END:			LE TYP	ES:	-			SOILS DENSITY: PLASTIC SOILS DENSITY: NOTES: SB-31-1.1-060507(0.0-2.2): TAL Metals, TOC, SPLP TAL
	mean sea level below ground		D: driv W: wa	shed		MOIST dry	URE:	5-10	Metals, Petrography, XRD 3-4: Soft 3-6.060507 (4.5-7.6): TAL Metals, TOC, Petrograph
ND =	surface not detected		A: Au		1	moist wet		30-4	-49: dense 9-15: stiff XRD
	not measured not applicable		C: cor			PROPO		IS:	>30: hard ' Density designation based on blow RQD (rock quality designation):
	61		RC: rot	asonic c	ore	Trace: < Little: 6			6-30% counts for each 12" of penetration using a 140 lb. hammer w/30" drop and longer/ length of run] x100

	CH2M	HILL
-12 Maria		

DDO II	ECT NAME.	Ouanta	Poso	urcos				SURFACE ELEVATION: 7.1 ft. MSL	
							MEASURING POINT: N/A		
									MEASURING POINT ELEVATION: N/A
	EC NOWBE		Honeyw						
					viron	mental	Servic	es, Inc	c. FOREMAN: J Rousa
	ING METHO								DRILLING EQUIPMENT: Geoprobe 6610
									A Harriage
									FINISH DATE: 06/04/2007
NORT	HING:	838	7.55		EAS	STING:	_ 632	2989.4	APPROX. DEPTH TO WATER: 5.0 ft. bgs 6/4/07 (moderate rain)
			ES /#.)			SCREE	ening Ta	1	MATERIALS DESCRIPTION g WELL CONSTRUCTIO
(6)	NOI		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	(F)				ELEVATION (ft. MSL)	MATERIALS DESCRIPTION TO SERVICE OF THE PROPERTY OF THE PROPE
(FT. BGS)	SAMPLE OR RUN DESIGNATION	닖	R 6.1	RECOVERY/ PENETRATION (Ë	
	SSIG	SAMPLE TYPE	E E	ER	,			Į į	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors
DEPTH	APLE N DE	MP.	88 8	8 8	۵			EVA.	ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
DE	SAN	S. S.	B.	22	ROD	品	윤	3	types, weathering, and degree of fracturing
_0					ļ	ļ	-	0	0
		D	N/A	2.1/5.0	N/A	(rain)	N/A		Fine sand and fine angular gravel, some cobbles, some crushed brick, brown, 7.5YR, 4/4, saturated,
 					İ			-	medium dense (FILL)
						<u></u>		<u> </u>	
						N/A (rain)	N/A		Crushed brick (FILL)
						(12,11)		Ļ	3-
						N/A	N/A		Crushed concrete (FILL)
+						(rain)		-	
⊢ 5		D	N/A	1.5/5.0	N/A	N/A	N/A	-5	Silty peat, some small sub-rounded cobbles/coarse PT/ML 5-
ľ.			,	'		(rain)			gravel/native?, very dark grey, 10YR, 3/3, saturated,
				1				-	soft/loose (SILTY PEAT)
-								-	7-
ļ									
†								┟	8-
. <u>L</u>				•		N/A (rain)	N/A	L	Fine sand, very well sorted, dark grey, 7.5YR, 4/1, SP saturated, loose, slight sheen on groundwater
1								ŀ	(SAND)
-10		Ŀ						-10	10
		D	N/A	1.5/5.0	N/A	N/A (rain)	N/A		Same as above but with moderate grading towards bottom of recovery to medium sand (SAND)
t								<u> </u>	
					Ì				
		ŀ		l			Ì		
-								F	13-
						ļ			/
-								-	14-
15								15	
13							_	-15	Bottom of boring @ 15 ft. bgs
-								F	
		<u> </u>	<u> </u>	<u> </u>	L.,	<u> </u>		<u> </u>	
	END: mean sea level		SAMPL D: driv		ES:			LAR SC 0-4	OILS DENSITY: PLASTIC SOILS DENSITY: NOTES: very loose 0-2: very soft
	below ground		W: was	shed	ne	MOISTU dry moist	JKE:	5-10	9: medium dense 5-8: medium soft
	surface ST: Shelby Tube ND = not detected A: Auger							30-4	9: dense 9-15: stiff
1	NM = not measured HA: hand auger N/A = not applicable C: cored					PROPO		S:	>30: hard Density designation based on blow RQD (rock quality designation):
								ew: 16- ome: 3	30% counts for each 12" of penetration reported in % = [length of core in pieces 4"



-422													
PROJE	ECT NAME: _		Quanta	Resou	ırces				SURFACE ELEVATION: 6.9 ft. MSL				
LOCATION: Former Lever Brothers Property													
PROJE	ECT NUMBER	l: _	332898	.QT.Q	7.AS	.CD.03			MEASURING POINT ELEVATION: N/A				
CLIEN	T:		Honeyw	rell _					TOTAL DEPTH: 15 ft.				
DRILLI	ING CONTRA	СТ	OR: <u>S</u>	SS En	vironi	mental S	Servic	es, Inc.	FOREMAN: J Rousa	· · · · · · · · · · · · · · · · · · ·			
DRILLI	ING METHOD	: _	Direct P	ush				<u> </u>	DRILLING EQUIPMENT: Geoprobe 6610				
SAMPI	LING METHO	D: _	5 ft. ma	crocor	e sar	npler			CH2M OBSERVER: A Harclerode				
START	Γ DATE:		06/04/2	007					FINISH DATE:06/04/2007				
NORT	HING:718	3398	8.93		EAS	STING:	_632	999.40	APPROX. DEPTH TO WATER: 2.4 ft. bgs 6/4/07 (moder	ate rain)			
			ES (i)			SCREE		} L	MATERIALS DESCRIPTION	ONSTRUCTION			
TH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	0			ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing				
DEPTH	SAM	SAN	BLC	PE	Rab	PD	윤		ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing				
_0		D	N/A	1.1/5.0	N/A	N/A (rain)	N/A	0	Organic sandy silt, dark brown, 7.5YR, 4/4, moist, soft (FILL)				
						N/A (rain)	IVA	-	Sandy silt, crushed brick, crushed concrete, saturated, medium dense (FILL)				
-		D	N/A	2.5/5.0	N/A	N/A (rain)	N/A	,	Same as above with slight sheen on groundwater, refusal @ approx. 10' bgs (FILL) 6- 7- 8-				
— 10	·							-10	Bottom of boring @ 10 ft. bgs				
						L			117				
LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable SAMPLE TYPES: D: drive W: washed ST: Shelby Tube A: Auger HA: hand auger C: cored RC: rotasonic core					oe r	SOIL: G MOISTI dry moist wet PROPO Trace: < Little: 6-	URE: PRTION 25% F	0-4: v 5-10: 11-29 30-49 50+: IS: ew: 16-3					



BORING LOG BORING/WELL ID: SB-34C

L					L	 			
	ECT NAME: _								SURFACE ELEVATION: 7.4 ft. MSL
		MEASURING POINT: N/A							
PROJECT NUMBER:332898.QT.Q7.AS.CD.03									MEASURING POINT ELEVATION: N/A
									TOTAL DEPTH: 5 ft.
					viron	mental :	Servic	es, Ind	ic. J Rousa
DRILL	ING METHOD): _	Direct F	ush					DRILLING EQUIPMENT: Geoprobe 6610
SAMP	LING METHO	D: _	5 ft. ma	crocor	e sar	npler			CH2M OBSERVER: A Harclerode
STAR	T DATE:		06/04/2	007 .					FINISH DATE: 06/04/2007
NORT	HING:71	8375	5.54		EAS	STING:	632	984.0	O9 APPROX. DEPTH TO WATER: 5.0 ft. bgs 6/4/07
			ES /ft.)	_		SCREE			MATERIALS DESCRIPTION G WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	04	FIO	ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing WELL CONSTRUCTION WELL CONSTRU
_0		D	N/A	3.6/5.0	N/A	N/A (rain)	N/A	0	Hetetrogeneous mix of crushed brick, gravel, silt, and sand, moist, medium dense (FILL)
	0.9' to 1.6' (SB- 34C-1.3-060407)		,		-	N/A (rain)	N/A		Same as above but with obvious product odor, little black product, and trace/little slag, saturated (perched groundwater) (FILL)
						N/A (rain)	N/A .		Same as top 0.9' above (FILL)
							:	-	3- 00/ 00/ 00/ 00/ 00/ 00/ 00/ 00
— 5			`			N/A (rain)	N/A	-5	Crushed brick and concrete, some gravel, dry, dense, refusal @ approx. 5' bgs (FILL)
					٠			_	Bottom of boring @ 5 ft. bgs
LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable SAMPLE TYPES: D: drive W: washed ST: Shelby Tube A: Auger HA: hand auger C: cored RC: rotasonic core					e ore	MOISTU dry moist wet PROPOR Trace: <5 Little: 6-1	IRE: RTIONS 5% Fe	0-4: \ 5-10: 11-29 ,30-49 50+: 8:	



PROJECT NAME: Quanta Resources											
LOCATION:	rothe	ners Property MEASURING POINT: N/A									
PROJECT NUMBER:	332898.			CD.03 MEASURING POINT ELEVATION: N/A							
CLIENT:	Honeyw	ell				-	TOTAL DEPTH: 15 ft.				
DRILLING CONTRAC	TOR: SO	S Envi	ronme	ental S	ervice	es, Inc.	FOREMAN: J Rous	a	:		
DRILLING METHOD:	Direct P	ush					DRILLING EQUIPMENT: Geopro	be 661	0		
			samp	ler			CH2M OBSERVER: A Hard	erode			
START DATE:	06/04/20	007					FINISH DATE:06/04/2	007			
							APPROX. DEPTH TO WATER: 4.				
DEPTH (FT. BGS) SAMPLE OR RUN DESIGNATION	SAMPLE TYPE BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	DAT		ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	WELL CONSTRUCTION	
_0	D N/A	2.5/5.0	N/A	N/A (rain)	N/A	0	Silty sand, brown, 7.5YR, 4/4, moist, medium dense (FILL)	000000000000000000000000000000000000000		0 1- 2- 3-	
-5 -	N/A	1.5/5.0	N/A	N/A (rain) N/A (rain)	N/A N/A	-5	Medium/coarse sand, some fractured rock/cobbles, dark brown, 7.5YR, 4/3, moist/saturated, medium dense (FILL) Coarse sand/fine angular gravel, dark brown, 7.5YR, 4/3, saturated, medium dense (FILL)	000000000000000000000000000000000000000		5-	
				N/A (rain)	N/A	-	Crushed mudstone, some sand, black, saturated, medium dense/dense (FILL)	000000000000000000000000000000000000000		9-	
- 10 -	N/A	1.5/5.0	N/A	N/A (rain)	N/A	-10	Coarse sand/fine angular gravel, dark brown, 7.5YR, 4/3, saturated, medium dense (FILL)	0000000		11 - 12 -	
-				N/A (rain)	N/A		Crushed mudstone, some sand, black, saturated, medium dense/dense (FILL)	000000		13-	
— 15 						-15	Bottom of boring @ 16 ft bgs			15-	
LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable	D: driv W: was ST: She A: Aug HA: har C: cor	shed elby Tubo ger nd auger	e N	MOISTI dry moist wet	URE:	0-4: 5-10 11-2 30-4 50+:	DILS DENSITY: PLASTIC SOILS DENSITY: very loose 0-2: very soft : loose 3-4: soft 9: medium dense 5-8: medium soft 9: dense 9-15: stiff very dense 16-30: very stiff >30: hard Density designation based on blow counts for each 12: of penetration 1409// stress 1404/9.5 den	% = [leng	th of co	ore in pieces 4"	

	CH2MHILL	
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BORING/WELL ID: SB-35B

LOCA PROJI			Quanta Forme						SURFÁCE ELEVATION: 4.7				**	
PROJ			Forme	<u>r Lever</u>	Broth	ners Pro	nerty							
	ECT NUME								MEASURING POINT: N/A				<u>.</u>	
CLIEN									MEASURING POINT ELEVATION					
	IT:								TOTAL DEPTH: 15 ft.					
DRILL	ING CONT	RACT	or: S	GS En	vironi	nental S	Servic	es, Inc	FOREMAN: J Rous	sa				
DRILL	ING METH	IOD: _	Direct	Push				·	DRILLING EQUIPMENT: Geopr	obe 661	0			
SAMP	LING MET	HOD:	5 ft. ma	acrocor	e san	npler		~	CH2M OBSERVER: A Hard	lerode				
STAR	T DATE: _		06/04/2	2007					FINISH DATE: 06/04/	2007				e"
NORT	HING:	71805	1.23		. EAS				APPROX. DEPTH TO WATER: 4		s 6/4/	07		
·				1	ı									
			ES /ft.)			SCREE			MATERIALS DESCRIPTION]	30L	WEL	L CONS	TRUCTIO
(S)	NO		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)				ELEVATION (ft. MSL)		₀	GROUP SYMBOL			
(FT. BGS)	SAMPLE OR RUN DESIGNATION	밀	R 61	\ ≥N				#) Z	20110	GRAPHICAL LOG	UP S		,	,
<u>E</u>	EOF	SAMPLE TYPE	1 H H	VER I				ρ	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors	ĕ	SRO.			
DEPTH	MPL	MPL	§ 8		Rab			ΕVΑ	ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	3AP!	nscs	٠,		
ㅂ	SA RL	SA SA	<u> </u>	1 2 2	Ä	음	윤	ᇳ	types, weathering, and degree of fracturing	5	S.	-		
	٠.											•		
-0		D	N/A	2.5/5.0	N/A	N/A	N/A	_0	See log for SB-35A for general lithological	2201		0		
L .	-		1	1		(rain)			description .					
						,						']	÷	
-												2-	•	
										No.				
-												3-		
-								_						
			,						•			7		
-5			N/A	1.5/5.0	N/A	,**	 	— -5				5-		
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- 10		D	N/A	1.5/5:0	N/A		· .	— -10				10 -	•	
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-			.,					-		ION M		12-		
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			· .	1								13		•
 			5,				, ,	-		1000		14-		
				1								.		
- 1 5		-							Bottom of boring @ 15 ft bgs	100		15-	:	
L I						.		_				15		
]		<u> </u>			,]		16 –		
msl = 1 bgs = 1 ND = 1 NM = 1	END: mean sea let below ground surface not detected not measure not applicable	d	D: driv W: wa ST: Sh A: Au HA: ha C: cor	shed elby Tub ger nd auge	pe r	MOISTL dry moist wet PROPOI Trace: <	IRE:	0-4: v 5-10: 11-29 30-49 50+:	PILS DENSITY: PLASTIC SOILS DENSITY: Pery loose 0-2: very soft loose 3-4: soft: medium dense 5-8: medium soft every dense 9-15: stiff very dense 16-30: very stiff >30: hard Density designation based on blow counts for each 12" of penetration Page 15-15 penetration per local per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration per local penetration penetration per local penetration pen	quality desi	gnation);	• .	



BORING/WELL ID: SB-36

PROJ	ECT NAME: _		Quanta	Resou	urces				SURFACE ELEVATION: 6.8 ft. MSL
LOCA	TION:		Quanta	Resou	ırces	Proper	ty		MEASURING POINT: N/A
PROJ	ECT NUMBER	} : _	332898	.QT.Q	7.AS.	CD.03			MEASURING POINT ELEVATION: N/A
CLIEN	IT:		Honeyw	rell					TOTAL DEPTH: 15 ft.
DRILL	ING CONTRA	СТ	OR: SO	3S Env	vironi	mental (Servic	es, Inc	ic. FOREMAN: J Rousa
	ING METHOD								DRILLING EQUIPMENT: Geoprobe 6610
									CH2M OBSERVER: D Finney
						,			FINISH DATE: 06/04/2007
						,			19 APPROX. DEPTH TO WATER: 4.2 ft. bgs 6/4/07
	:		ES '			SCREE			MATERIALS DESCRIPTION G WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	RQD	PID	FID	ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing WELL CONSTRUCTI
_0								0	
		D	N/A	3.7/5.0	N/A	ND	N/A		Coarse sand and gravel, trace organics and silt, light brownish-grey, 10YR, 6/2, dry (FILL)
-	0.8' to 1.2' (SB \-36-1.0-060607)/					ND /	N/A N/A	1	Coarse sand, little gravel, yellowish brown, 10YR, 5/4, dry (FILL)
-	1.2' to 2.2' (SB -36-1.7-060607)/					ND	N/A	-	Fine sand, little coal fragments, trace brick, black, dry (FILL)
-	<u>(</u>			:		ND	N/A	-	Fine sand, trace coarse sand and gravel, very dusky red, 10R, 2.5/2, dry, dense @ 1.6' bgs inclusion of pale yellow, fine to coarse crystals (possibly sulfur?)
	3.2' to 5.2' (SB -36-4.2-060607)					ND	N/A		Fine to coarse sand, trace silt and gravel, reddishyellow, 5YR, 5/6, some inclusions of more reddish color (FILL)
								5	Fine sand, trace coarse sand and gravel, trace silt, dusky red, 10R, 3/6, mottle with pale yellow, 2.5Y, 8/3, saturated (FILL)
- 5		D	N/A	3.3/5.0	N/A	ND	N/A		Silt-like material (possibly gypsum fill?), white/pale brown, 10YR, 8/1/10YR, 8/2, saturated, soft (FILL)
-	5.9' to 6.7' (SB -36-6.3-060607)			-		ND	N/A		Fine sand, little coal, gravel, coarse sand, brick, and cinder/slag, black, saturated (FILL)
_		-				ND ND	N/A		Silt, trace clay, organics, and fine sand, dark brown, 10YR, 3/3, saturated, soft, grades to more fine sand with depth (SILT)
								-	9-
<u> </u>								-10	Bottom of boring @ 10 ft bgs
msl = bgs = ND = NM =	END: mean sea level below ground surface not detected not measured not applicable		SAMPL D: driv W: was ST: She A: Aug HA: har C: core RC: rote	e shed elby Tub ger nd auge ed	oe er	SOIL: G MOISTI dry moist wet: PROPO Trace: <	JRE: RTION	0-4: 5-10 11-2 30-4 50+:	SOILS DENSITY: PLASTIC SOILS DENSITY: : very loose : 3-4: soft 29: medium dense : very dense : very dense : very dense Density designation based on blow counts for each 12" of penetration Density designation based on blow counts for each 12" of penetration



BORING/WELL ID: SB-37

					<u> </u>				7. * x				
PROJ	ECT NAME: _		Quanta	Reso	urces	·		·	SURFACE ELEVATION: 6.9 f	t. MSL			
LOCA	TION:		Quanta	Reso	urces	Prope	rty		MEASURING POINT: N/A				
PROJ	ECT NUMBER	ጻ: _	332898	COT.Q	7.AS	.CD.03	•	· · ·	MEASURING POINT ELEVATION	: <u>N</u> /	Ά		
CLIEN	IT:		Honeyw	vell		<u> </u>			TOTAL DEPTH:10 ft.				
DRILL	ING CONTRA	CTO	OR: S	GS En	viron	mental	Servic	es, Ind	FOREMAN: J Rous	sa			
DRILL	ING METHOE): _	Direct F	ush					DRILLING EQUIPMENT: Geopre	obe 66	10		
									CH2M OBSERVER: A Hard				
	T DATE:								FINISH DATE: 06/06/				
									7 APPROX. DEPTH TO WATER: 2		ns 6/6/	07	
				,	,				A CHONDER IN TO WATER.		<u>, , , , , , , , , , , , , , , , , , , </u>		
			ES /#.)			SCRE	ENING .TA	1	MATERIALS DESCRIPTION		乌	WELL CONSTR	UCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	RQD	OIA	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL		
				İ		ŀ							
_0		D	N/A	2.4/5.0	N/A	ND	. N/A	0	Mix of silt, fine sand, and angular gravel/crushed rock, very dark brown, 7.5YR, 2.5/2, dry, dense (FILL)			1-	·
						ND	N/A	<u>-</u>	Crushed rock/cobbles, some coarse sand/fine fine sub-rounded gravel, brown, 7.5YR, 4/4, saturated, dense (FILL)			2-	
						ΝD	N/A		Silt with sub-rounded gravel, brown, 7.5YR, 4/4, saturated, dense (FILL)				
	3.9' to 5.0' (SB- 37-4.5-060607)					ND	N/A		Medium sand, little slag, very dusky red, 2.5YR, 2.5/2, saturated, foose (FILL)			4-	
-5						ND	N/A	-5	Same as above but dark brown, 7.5YR, 4/4 (FILL)				
-		D	N/A	1.1/5.0	N/A	23.2	N/A		Clayey peat, black, saturated, soft (CLAYEY PEAT)	-Z-7	CL/PT	6-	
-				7777 777			A COLUMN TO THE			7.7.	ŝ	8-	
- - 10									Bottom of boring @ 11 ft bgs	-7-7		9-	
1.50	TND:		SAMPL	E TVP	-g. l.	2011 - 0		AD 0.5	NIC STANISH DATES			11	
bgs = I ND = r NM = r	END: mean sea level below ground surface not detected not measured not applicable		D: drive W: was ST: She A: Aug HA: han C: core RC: rota	e shed elby Tub jer id augel ed	oe r ore	MOISTL dry moist wet PROPO Trace: <	JRE: RTION: 5% Fe	0-4: v 5-10: 11-29 30-49 50+: S:	loose 3-4: soft): medium dense 5-8: medium soft 0: dense 9-15: stiff very dense 16-30: very stiff >30: hard Density designation based on blow counts for each 12" of penetration 00% counts for each 12" of penetration	uality des	signation	AL Metals, TOC, Petr	ography,



BORING/WELL ID: SB-38

PROJI	ECT NAME: _		Quanta	Resou	ırces				su	RFACE ELEVATION:	6.5ft.	MSL				
LOCA	TION:		Quanta	Resou	ırces	Proper	ty		ME	ASURING POINT:	N/A					
PROJI	ECT NUMBER	t:	332898	.QT.Q	7.AS	.CD.03				EASURING POINT EL	EVATION	N//	4			
CLIEN	T:		Honeyw	/ell					тс	TAL DEPTH:	10 ft.					
DRILL	ING CONTRA	СТО	or: So	GS En	viron	mental S	Servic	es, Inc	FC	PREMAN:	J Rous					
	ING METHOD									RILLING EQUIPMENT		be 661	0			
										12M OBSERVER:						
	T DATE:									NISH DATE:						
										PPROX. DEPTH TO W						
NON	ning	302	2.00		EAS	oring.		010.0	<u>~</u> Аг	PROX. DEPTH TO W	AIEN. <u>0.</u>	11. bg	3 0/0/	.07		
			t. (3			SCREE		ł .	МАТ	ERIALS DESCRIPTION)N		٥ ا	WEL	L CONS	STRUCTION
	z		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	Ê	'	DA	ΓA l	MSL)] ,]	SYMBOL			
(FT. BGS)	IATK	m	0 N	RECOVERY/ PENETRATION (FT.)								GRAPHICAL LOG	P S			
E	OR Sign	SAMPLE TYPE	PER E RI	*ATI				ELEVATION (ft.	SOILS: density, seconda	color, classification, moist ry grain size, and other de	ure, escriptors	CAL	GROUP			
=	PLE	PLE	WS	SE				VAT		, color, hardness, major r		\ PH	ဗ			
ОЕРТН	SAMPLE OR RUN DESIGNATION	SAM	BLO or (Ää	Pag	E G	윤	33		eathering, and degree of f		GR,	nscs			
_0				-				_0		····		28:1		0_		
		D	N/A	3.2/5.0	N/A	ND	N/A			oarse sand, little silt, very 5/2, dry, medium dense (l		00/				
								ļ		,	,	200				
-								Γ					.*	1-		
										<u></u>						
-	1.7' to 3.4' (SB					ND	N/A	}		oarse sand and gravel, vereddish brown, 2.5YR, 4/4				2-		
	-38-2.5-060607)								medium dense (F		,,					
								L						3-		
	3.4' to 7.3' (SB					ND	N/A			gravel, trace silt, dark re-		00		1 1		
-	-38-5.4-060607)							<u> </u>		id observed (FILL)	.s it bys	0		4-		
								İ								
_5		_			<u></u>	-		— -5						5-		•
		D	N/A	3.7/5.0	N/A				·			ΟΣ,				
			İ					L						6-		
				1								200				
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-								Ī	. · ·					7-		
						ND	N/A		pale brown, 10YF	erial (possibly gypsum?), v R, 8/1/10YR, 8/2, saturate	white/very ed, soft			-		
-								-	(FILL)					8		
						ND	N/A			d coarse sand, dark grey ugs of yellow, 2.5Y, 8/6, s		NOX4		-		
					:	1		_		throughout (SILT)	,			9-		•
					١,	ND .	N/A	1	Meadow mat (PE	AT)			CL/PT/			
.	9.4' to 9.6' (SB		1.			ND /	N/A /	1	Angular gravel, to	ace fine sand and silt, co	al tar,			1]		
10	-38-9.5-060607)		 	 		ND /	N/A	-10	black, saturated	(FILL)			CL/PT	10-		
						/			Meadow mat (PE	AT)						
Ļ					.			-						11		
ļ	<u> </u>		<u> </u>	<u></u>					011 0 DEFISITO 5	AOTIO COIL C DENGITA	NOTES:			L		
	END: mean sea level		SAMP! D: driv	'e	±S:	SOIL: G MOIST		0-4:	very loose	ASTIC SOILS DENSITY: 0-2: very soft	SB-38-2.5-06 Metals, Petr			TAL Me	tals, TOC,	SPLP TAL
	below ground surface		W: was	elby Tul	ре	dry		11-2): loose 9: medium dense	3-4: soft 5-8: medium soft				Metals, 1	OC, Petro	ography, XRD
	not detected not measured		A: Aug HA: hai		er	wet			l9: dense : very dense	9-15: stiff 16-30: very stiff >30: hard	ROCK:					
	not applicable		C: cor	ed		PROPO			Density des	ignation based on blow ach 12" of penetration	RQD (rock of reported in 9	% = {lengt	h of cor	re in pie	ces 4"	,
1					- 1		450/ 0		4 400/	the house and the desire	and longer/ t	enath of	un) y10	າດ		



BORING/WELL ID: SB-28

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	8.8 ft. MSL
LOCATION:	Block 93 North	MEASURING POINT:	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:1	O ft.
DRILLING CONTRACT	OR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6010
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	A Harclerode
START DATE:	06/05/2007	FINISH DATE:	06/05/2007
NORTHING: 7191	91.85 EASTING : 632578.96	APPROX. DEPTH TO WA	TER: 3.5 ft. bgs @ 09:30 on 6/5/07

			E S			SCREE			MATERIALS DESCRIPTION		20	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	Old.	OH OH	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
.0		D	N/A	2.5/5	N/A	ND	N/A		Mix of fine/silty sand and coarse, angular gravel/cobbles, very dark brown, 7.5YR, 2.5/2, dry, medium dense (FILL)	000000000000000000000000000000000000000		
						62.3	N/A		Gravelly, fat clay, strong brown, 7.5YR, 4/6, moist, soft (FILL)	0000000	/	2-
	2.9' to 3.9' (SB- 28-3.4-060507)		Łż.			ND	N/A		Fine, angular gravel with little slag, black, dry, loose/medium dense (FILL)	0.00		3-
						ND	N/A	-5	Crushed concrete (FILL)			4- =
21						ND	N/A	_	Silt, some angular gravel, very dark brown, 7.5YR, 2.5/2, moist, very soft (FILL)	000000000000000000000000000000000000000		
5		D	N/A	1.9/5	N/A	ND	N/A		Fine, angular gravel/coarse sand, trace silt, trace slag, black, saturated, dense (FILL)	00/		5-
	5.6' to 7.0' (SB- 28-6.3-060507)									0000	_	6-
								-		0000		7-
						ND	N/A	-	Clayey silt, some organic material, very dark brown, 7.5YR, 2.5/2, moist/saturated, soft (CLAYEY SILT)	H	ML	8-
								-0		H		9-
10								-	Different of harders O 10 ft have	I		10-
							1	14	Bottom of boring @ 10 ft, bgs			
			Jan.				N-m			1		117

msl = mean sea level bgs = below ground surface ND = not detected NM = not measured

N/A = not applicable

D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger
C: cored
RC: rotasonic core

MOISTURE: 0-4: very loose 0-2: very soft dry 5-10: loose 3-4: soft wet 30-49: dense 50+: very dense 50+: very dense 50+: very dense 50+: very dense 730: hard PROPORTIONS:

Trace: <5% Few: 16-30% Counts for each 12" of penetration using a 140 lb. hammer w/30" drop

SB-28-3.4-060507(2.9-3.9): TAL Metals, TOC, SPLP TAL Metals, Petrography, XRD SB-28-6.3-060507 (5.6-7.0): TAL Metals, TOC, Petrograph XRD

ROCK:

ROD (rock quality designation); reported in % = [length of core in pieces 4* and longer/ length of run] x100

0-5 FT. BGS

TOP



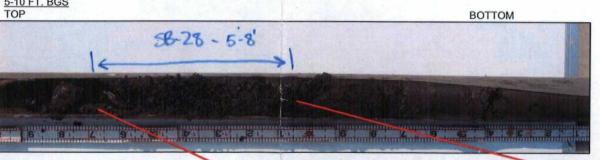
MINERAL CONSTITUENTS	SB-28-3.4- 060507
Quartz	11
Cristobalite	The year of
P-Feldspar	3
K-Feldspar	1
Calcite	1
Dolomite	
Siderite	
Halite	
Gypsum	
Hornblende	trc
Augite	2
Sulfur	
Mullite	13
Magnetite	8
Hematite	
Goethite	8
Akaganeite	1523
Pyrite	AND AREL DON
Jarosite	I WAR SERVE
Kaolinite	trc
Chlorite	trc
Illite / Mica	1
Mixed-Layered Illite/Smectite	2
Amorphous	50
TOTAL	100

MINERAL	SB-28-6.3- 060507
CONSTITUENTS	
Quartz	21
Cristobalite	
P-Feldspar	22
K-Feldspar	5
Calcite	1
Dolomite	Etter market 190
Siderite	
Halite	
Gypsum	trc
Hornblende	
Augite	4
Sulfur	
Mullite	5
Magnetite	8
Hematite	2
Goethite	
Akaganeite	
Pyrite	
Jarosite	
Kaolinite	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Chlorite	
Illite / Mica	1
Mixed-Layered	
Illite/Smectite	1
Amorphous	30
TOTAL	100



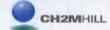
TYPICAL SLAG - 3.0-3.6 FT. BGS

5-10 FT. BGS TOP





TYPICAL SLAG - 5-8 FT. BGS



Cinder/Ash Investigation **Boring SB-28**

Quanta Resources Superfund Site – OU1 Edgewater, New Jersey

08/21/2007



BORING/WELL ID: SB-29

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	6.3 ft. MSL
LOCATION:	Block 93 North	MEASURING POINT: _	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:1	5 ft.
DRILLING CONTRACT	OR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6010
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	A Harclerode
START DATE:	06/05/2007	FINISH DATE:	06/05/2007
NORTHING: 7190	45.10 EASTING: 632565.07	APPROV DEPTH TO WA	TED: 2.71 ft bas @ 10:30 on 6/6/07

			ES (tr)			SCREE			MATERIALS DESCRIPTION		BOL	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	PID	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
.0		D	N/A	3.0/5.0	N/A	ND	N/A		Mix of fine/silty sand and coarse, angular			° n
	0.8' to 2.9'					ND	N/A	_5	gravel/cobbles, and asphalt, black, dry, medium dense (FILL)	000		1-
	(SB- 29-1.9-060507)					ND	N/A		Clean, medium sand, light brown, 7.5YR, 6/3, dry, medium dense (FILL)	000	_	2-
								-	Sandy silt, trace small angular gravel, very dark brown, 7.5YR, 2.5/2, and some reddish black 2.5YR, 2.5/1, dry/moist, dense (FILL)	00,000,000,000,000		3- =
				H		ND	N/A	-	Coarse sand, trace fine gravel, some brick, black and red, moist to saturated with depth, medium dense (FiLL)	000		4-
-5	5.0' to 8.4' (SB- 29-6.7-060507)	D	N/A	1.6/5.0	N/A	ND	N/A	-0	Fine/medium gravel, some brick, black and red, saturated, loose (FILL)	00000		5- 6- 7-
										380808		
						ND	N/A	-	Hard, semi-plastic tar, black, moist, very dense (FILL)	000		9-
10		D	N/A	2.3/5.0	N/A	ND	N/A		Soft tar with some fabric-like material, black, wet, loose/soft, obvious product odor (FILL)	0000		10-
						ND	N/A	5	Organic silt with some peat, very dark brown, 7.5YR, 2.5/2, moist, soft/very soft (SILT)		ML	11-
							19,		E.O.E. Month of Collection			12-
1												13-
								-				14-
15					-59		731	-	Bottom of boring @ 15' bgs			15-
			1									16

	LEGEND:
١	msl = mean sea level
	bgs = below ground
1	surface
ı	ND = not detected
П	All 4 not management

HA: hand auger C: cored RC: rotasonic core NM = not measured N/A = not applicable

SAMPLE TYPES:
D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger
C: cored
RC: rotasonic core

Trace: <5% Few: 16-30%
Little; 6-15% Some; 31-49%

SOILS DENSITY: PLASTIC SOILS DENSITY:
0-4: very loose
0-2: very soft
3-4: soft
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3-4: soft
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3-4: soft
3-4: PROPORTIONS:
Trace: <5% Few: 16-30%
Little: 6-15% Some: 31-49%

Density designation based on blow counts for each 12" of penetration using a 140 lb. hammer w/30" drop

NOTES: SB-29-1.9-060507(0.8-2.9): TAL Metals, TOC, SPLP TAL Metals, Petrography, XRD SB-29-6.7-060507 (5.0-8.4): TAL Metals, TOC, Petrograph

ROCK:
ROD (rock quality designation):
reported in % = [length of core in pieces 4"
and longer/ length of run] x100

0-5 FT. BGS TOP





SAMPLE - 0.8-2.9 FT. BGS

MINERAL CONSTITUENTS	SB-29-1.9- 060507
Quartz	5
Cristobalite	1
P-Feldspar	trc
K-Feldspar	1
Calcite	trc
Dolomite	
Siderite	7
Halite	
Gypsum	
Hornblende	K = 75 185
Augite	
Sulfur	for the same
Mullite	19
Magnetite	5
Hematite	
Goethite	4
Akaganeite	1
Pyrite	Maria Maria
Jarosite	
Kaolinite	trc
Chlorite	
Illite / Mica	1
Mixed-Layered Illite/Smectite	1

100

TOTAL

TOP

5-8.5 FT. BGS



NO VISUAL EVIDENCE OF CINDER/SLAG



SAMPLE - 5.0-8.4 FT. BGS



воттом

Cinder/Ash Investigation **Boring SB-29**

Quanta Resources Superfund Site - OU1 **Edgewater, New Jersey**

08/21/2007

	CH2MHILL
-	OTTE THE

BORING/WELL ID: SB-30

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	7.8 ft. MSL
LOCATION:	Block 93 North	MEASURING POINT:	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH: 2	O ft.
DRILLING CONTRACT	TOR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6610
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	D Finney
START DATE:	06/05/2007	FINISH DATE:	06/05/2007
NORTHING: 7191	17.98 EASTING : 632612.12	APPROX. DEPTH TO WA	TER: 4.0 ft. bgs @ 13:00 on 6/5/07

			HES aff.)			SCREE		1	MATERIALS DESCRIPTION		BOL	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION SAMPLE TYPE BLOWS PER 6 INCHES or CORE RUN (time/ft.) RECOVERY/ PENETRATION (FT.)		ROD	PID	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL			
0		D	N/A	2.3/5.0	N/A	ND	N/A		Fine sand and fine angular gravel, reddish brown, 5YR, 4/4, dry (FILL)	000		
	1.5' to 3.5' (SB- 30-2.5-060507)		144			ND	N/A	-	Very fine sand and angular gravel, dark grey 10YR, 4/1, moist, medium dense (FILL)	000	-	2-
	30-2.5-060507)							-5	Coarse sand, little fine sand and gravel, some plastic tar, trace brick, trace slag, dark grey, 10YR, 4/1, moist, medium dense, sheen on groundwater	000000000000000000000000000000000000000		3-
5	4.0' to 15' (SB- 30-9.5-060507)					ND	N/A	-	(FILL)	1		5-
	30-8.5-00030//	D	N/A	1.4/5.0	N/A	ND	N/A	- - 0	Fine gravel/coase sand, some medium sand, little silt, trace slag, dark grey, 10YR, 2/1, saturated (FILL)	000000000000000000000000000000000000000		7-
10		D	N/A	1.3/5.0	N/A	ND	N/A	-	Same as above with black liquid tar from	0000		9-
						1.5			approximately 10-12" bgs (FILL)	000		11-
						47		5		0000		13-
15		D	N/A	4.0/5.0	N/A	59.8	N/A	-	Meadow mat (CLAYEY PEAT)	-7-7	PT/CL	15-
					Lagar.			-		-72-7		17-
			15	100			1	10		-7-7		18-
~~										-7-7		19-
20							10		Bottom of boring @ 20 ft. bgs	40		20 -

LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured

D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger C: cored RC: rotasonic core N/A = not applicable

SAMPLE TYPES:

| SOIL: GRANULAR SOILS DENSITY: PLASTIC SOILS DENSITY: MOISTURE: 0-4: very loose 0-2: very soft dry 5-10: loose 3-4: soft dry moist 11-29: medium dense 5-8: medium soft 9-15: stiff 50+: very dense 50: very dense 30: hard PROPORTIONS: Density designation based on blow counts for each 12" of penetration using a 140 lb. hammer w/30" drop

NOTES: SB-30-2.5-060507(1.5-3.5): VOCs, SVOCs, TAL Metals, TOC, SPLP TAL Metals, Petrography, XRD SB-30-9.5-060507 (4.0-15): TAL Metals, TOC, Petrography XRD

ROCK:
ROD (rock quality designation):
reported in % = [length of core in pieces 4*
and longer/ length of run] x100

0-5 FT. BGS TOP



10-15 FT. BGS TOP



MINERAL CONSTITUENTS	SB-30-9.5- 060507
Quartz	10
Cristobalite	
P.Feldspar	19
K-Feldspar	7
Calcite	6
Dolomite	
Siderite	CARL NO WES
Halite	
Gypsum	1
Hornblende	trc
Augite	10
Sulfur	200
Mullite	11
Magnetite	
Hematite	trc
Goethite	
Akaganeite	
Pyrite	
Jarosite	
Kaolinite	trc
Chlorite	1
Illite / Mica	1
Mixed-Layered	
Illite/Smectite	4
Amorphous	30
TOTAL	100

MINERAL CONSTITUENTS	SB-30-2.5- 060507				
Quartz	10				
Cristobalite					
P-Feldspar	17				
K-Feldspar	3				
Calcite	4				
Dolomite					
Siderite					
Halite					
Gypsum	trc				
Hornblende	7				
Augite					
Sulfur					
Mullite	12				
Magnetite	5				
Hematite	1				
Goethite					
Akaganeite					
Pyrite					
Jarosite					
Kaolinite	1				
Chlorite	trc				
Illite / Mica	1				
Mixed-Layered	7.0				
Illite/Smectite	3				
Amorphous	<u>35</u>				
TOTAL	100				



SAMPLE (SB-30-9.5-060507) 4.0 - 15.0 FT. BGS

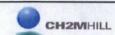


TYPICAL COAL/SLAG 4.0-15.0 FT. BGS

15-20 FT. BGS BOTTOM

TOP

NATIVE PEAT/ MEADOW MAT



Cinder/Ash Investigation **Boring SB-30**

Quanta Resources Superfund Site – OU1 Edgewater, New Jersey

08/21/2007



BORING LOG

BORING/WELL ID: SB-31

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	5.4 ft. MSL
LOCATION:	Block 93 North	MEASURING POINT:	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:1	5 ft.
DRILLING CONTRACT	SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6010
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	A Harclerode
START DATE:	06/05/2007	FINISH DATE:	06/05/2007
NORTHING: 7189	50.91 EASTING: 632638.30	APPROX. DEPTH TO WA	TER: 5.4 ft. bgs @ 13:00 on 6/6/07

The state of the s		S T			SCREE			MATERIALS DESCRIPTION		9	WELL CONSTRUCTION	
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	DA OIL	Q.	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
.0	0.0° to 2.2'	D	N/A	2.2/5.0	N/A	ND	N/A	5	Mix of fine/sitty sand and coarse angular	O		01 1
	(SB- 31-1.1-060507)					ND	N/A	[Mix of fine/silty sand and coarse, angular gravel/cobbles, very dark brown, 7.5YR, 2.5/2, dry, medium dense (FILL)	000000	_	1-
						ND	N/A			1 24		2-
						1.6	N/A			0000		3-
-12						0.7	N/A		Soft, plastic tar, black, moist, very soft (FILL)	0000		4-
-5	4.5' to 7.6'		. 7	1					Gravel with little slag, black, saturated, loose (FILL)		1	5
-5 (SB- 31-6.0-060507)	D	N/A	2.3/5.0	N/A	0.1	N/A	-0	Same as above but with some soft, plastic tar (FILL)	000000000000000000000000000000000000000		6- <u>−</u> <u>−</u>	
					4.4	N/A			SON	1	7-	
						2.8	N/A	-	Clayey, oranic peat/native, very dark brown, 7.5YR,	000	CLIPT	
						ND	N/A	-	2.5/2, moist, soft (CLAYEY PEAT)	-72-7	0011	8
			Files.			1.2	N/A	-		-72-7		9-
- 10		D	N/A	2.5/5.0	N/A	1.1	N/A	5	Same as above (CLAYEY PEAT)	-7-7	1	10-
							97	-		-//		11-
								-		-/-		12-
			1.6							-72-7		13-
			1.4							-72-7		14-
- 15				77				10	Bottom of boring @ 15 ft. bgs	-72-7		15-
								10	To the byg			16

LEGEND:

msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable

SAMPLE TYPES:
D: drive
W: washed
ST: Shelby Tube
A: Auger
C: cored
RC: rotasonic core

D: drive
W: washed
ST: Shelby Tube
A: Auger
C: cored
RC: rotasonic core
RC: rotasonic core

SOIL: GRANULAR SOILS DENSITY: PLASTIC SOILS DENSITY:
0-4: very loose
0-2: very soft
5-10: loose
3-4: soft
9-15: stiff
wet
30-49: dense
50+: very dense
16-30: very stiff
>30: hard
Density designation based on blow counts for each 12" of penetration
Little: 6-15% Some; 31-49%
Using a 140 lb. hammer w/30" drop

NOTES: SB-31-1.1-060507(0.0-2.2): TAL Metals, TOC, SPLP TAL Metals, Petrography, XRD SB-31-6.0-060507 (4.5-7.6): TAL Metals, TOC, Petrograph XRD

ROCK:
ROD (rock quality designation):
reported in % = [length of core in pieces 4*
and longer/ length of run] x100

0-5 FT. BGS TOP





SAMPLED 0.0 - 2.2 FT BGS INTERVAL

MINERAL CONSTITUENTS	SB-31-1.1- 060507
Quartz	14
Cristobalite	THE STREET
P.Feldspar	22
K-Feldspar	2
Calcite	HALL BALLON
Dolomite	EU WEST
Siderite	
Halite	
Gypsum	trc
Hornblende	1
Augite	12
Sulfur	
Mullite	3
Magnetite	7
Hematite	18.
Goethite	
Akaganeite	
Pyrite	
Jarosite	Mark Town
Kaolinite	trc
Chlorite	
Illite / Mica	3
Mixed-Layered	
Illite/Smectite	1
Amorphous	<u>35</u>
TOTAL	100

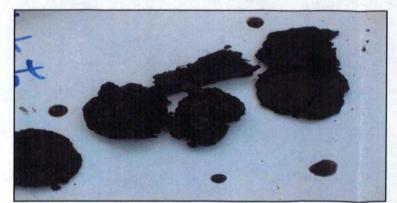


SAMPLED 4.5 - 7.6 FT BGS INTERVAL



SLAG/COAL - 4.5 - 7.6 FT. BGS

MINERAL CONSTITUENTS	SB-31-6.0- 060507
Quartz	19
Cristobalite	
P-Feldspar	8
K-Feldspar	3
Calcite	trc
Dolomite	
Siderite	
Halite	
Gypsum	
Hornblende	trc
Augite	1
Sulfur	
Mullite	10
Magnetite	9
Hematite	2
Goethite	
Akaganeite	
Pyrite	
Jarosite	
Kaolinite	trc
Chlorite	
Illite / Mica	2
Mixed-Layered	are line and the
Illite/Smectite	1
Amorphous	45
TOTAL	100



SOFT TAR & FIBROUS PAPER - 5.0-7.6 FT. BGS



Cinder/Ash Investigation **Boring SB-31**

Quanta Resources Superfund Site - OU1 **Edgewater, New Jersey**

08/21/2007



BORING/WELL ID: SB-34C

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	7.4 ft MSI
LOCATION:	Former Lever Brothers Property	MEASURING POINT:	
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:5	ft.
DRILLING CONTRACT	OR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6610
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	A Harclerode
START DATE:	06/04/2007	FINISH DATE:	06/04/2007
NORTHING: 7183	75.54 EASTING: 632984.09	APPROX DEPTH TO WA	TEP: 5.0 ft. bas 6/4/07

			ES (F			SCREE			MATERIALS DESCRIPTION		30L	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	Rab	Old	9	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
_0		D	N/A	3.6/5.0	N/A	N/A (rain)	N/A		Hetetrogeneous mix of crushed brick, gravel, silt, and sand, moist, medium dense (FILL)	000000000000000000000000000000000000000		
	0.9' to 1.6' (SB- 34C-1.3-060407)					N/A (rain)	N/A	-	Same as above but with obvious product odor, little black product, and trace/little slag, saturated (perched groundwater) (FILL)	000000		1-
						N/A (rain)	N/A	— 5	Same as top 0.9' above (FILL)	000000000000000000000000000000000000000		2-
										000000000000000000000000000000000000000		3-
						N/A (rain)	N/A		Crushed brick and concrete, some gravel, dry, dense, refusal @ approx. 5' bgs (FILL)	30000000000000000000000000000000000000		4-
-5										000		5-

5-10 FT. BGS TOP



TYPICAL SLAG - 0.9 - 1.6 FEET BGS

MINERAL CONSTITUENTS	SB-34C-1.3- 060407
Quartz	9
Cristobalite	
P-Feldspar	trc
K-Feldspar	
Calcite	No. of the second
Dolomite	
Siderite	
Halite	1
Gypsum	trc
Hornblende	334 4 1 1 1 1 1 1 1 1 1
Augite	
Sulfur	The Company
Mullite	24
Magnetite	5
Hematite	25,495
Goethite	
Akaganeite	
Pyrite	
Jarosite	CONTRACTOR OF
Kaolinite	The state of the second
Chlorite	THE RESERVE
Illite / Mica	trc
Mixed-Layered	
Illite/Smectite	1
Amorphous	60
TOTAL	100

LEGEND:

msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable

SAMPLE TYPES:
D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger
C: cored
RC: rotasonic core

SAMPLE TYPES:
D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger
C: cored
RC: rotasonic core

SOIL: GRANULAR SOILS DENSITY: PLASTIC SOILS DENSITY:
D-4: very loose
S-4: soft
S-5-10: loose
11-29: medium dense
3-4: soft
30-49: dense
3-4: soft
5-8: medium soft
9-15: stiff
Soil: Very dense
16-30: very stiff
>30: hard
Counts for each 12* of penetration
Little: 6-15% Some: 31-49%
Little: 6-15% Some: 31-49%

Density designation based on blow counts for each 12* of penetration
using a 140 lb. harmer w/30* drop

Bottom of boring @ 5 ft. bgs

NOTES: SB-34C-1.3-060407(0.9-1.6): TAL Metals, TOC, SPLP TAL Metals, Petrography, XRD

ROCK:

RQD (rock quality designation): reported in % = [length of core in pieces 4" and longer/ length of run] x100



CH2IVIHILL

Cinder/Ash Investigation **Boring SB-34C**

Quanta Resources Superfund Site - OU1 **Edgewater, New Jersey**

08/21/2007



BORING LOG

BORING/WELL ID: SB-35A

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	4.8 ft. MSL
LOCATION:	Former Lever Brothers Property	MEASURING POINT:	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:1	5 ft.
DRILLING CONTRACT	FOR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6610
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER:	A Harclerode
START DATE:	06/04/2007	FINISH DATE:	06/04/2007
NORTHING: 7180	49.01 EASTING: 633342.97	APPROX. DEPTH TO WA	TER: 4.2 ft. bgs 6/4/07

			ES (L)			SCREE			MATERIALS DESCRIPTION		BOL	WELL CONSTRUCTIO
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	Old	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
_0		D	N/A	2.5/5.0	N/A	N/A (rain)	N/A		Silty sand, brown, 7.5YR, 4/4, moist, medium dense (FILL)	000000000000000000000000000000000000000		1-
						N/A (rain)	N/A		Medium/coarse sand, some fractured rock/cobbles, dark brown, 7.5YR, 4/3, moist/saturated, medium dense (FILL)	0000000		3-
-5			N/A	1.5/5.0	N/A	N/A (rain)	N/A	-	Coarse sand/fine angular gravel, dark brown, 7.5YR, 4/3, saturated, medium dense (FILL)	0000000		6-
						N/A (rain)	N/A	-	Crushed mudstone, some sand, black, saturated, medium dense/dense (FILL)	000000	6	8-
10			N/A	1.5/5.0	N/A	N/A (rain)	N/A	5 	Coarse sand/fine angular gravel, dark brown, 7.5YR, 4/3, saturated, medium dense (FILL)	00000000		11 -
						N/A (rain)	N/A	-	Crushed mudstone, some sand, black, saturated, medium dense/dense (FILL)	000000000000000000000000000000000000000		13-
- 15								10	Bottom of boring @ 16 ft bgs			15-
ogs = b ND = r NM = r	mean sea level pelow ground surface not detected not measured not applicable		D: driv W: was ST: She A: Aug HA: har C: core	shed elby Tub ger nd auge	e r	SOIL: G MOISTI dry moist wet PROPO Trace: < Little: 6-	RTION	0-4: 5-10 11-29 30-4: 50+: IS: ew: 16-		% = [leng	th of co	re in pieces 4"

5-10 FT. BGS TOP воттом

NO VISUAL EVIDENCE OF CINDER/SLAG





NO VISUAL EVIDENCE OF CINDER/SLAG



Cinder/Ash Investigation Boring SB-35A-B

Quanta Resources Superfund Site – OU1 Edgewater, New Jersey

08/21/2007



BORING/WELL ID: SB-36

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION:	6.8 ft. MSL
LOCATION:	Quanta Resources Property	MEASURING POINT:	N/A
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELE	VATION: N/A
CLIENT:	Honeywell	TOTAL DEPTH:1	
DRILLING CONTRAC	TOR: SGS Environmental Services, Inc.	FOREMAN:	J Rousa
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT:	Geoprobe 6610
SAMPLING METHOD	5 ft. macrocore sampler	CH2M OBSERVER:	D Finney
START DATE:	06/04/2007	FINISH DATE:	06/04/2007
NORTHING: 7189	89.83 EASTING: 633199.49	APPROX. DEPTH TO WA	TER: 4.2 ft. bgs 6/4/07

			#;			SCREE			MATERIALS DESCRIPTION		70	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	DA Old	G.	ELEVATION (ft. MSL.)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
0		D	N/A	3.7/5.0	N/A	ND	N/A		Coarse sand and gravel, trace organics and silt, light brownish-grey, 10YR, 6/2, dry (FILL)	000		0
	0.8' to 1.2' (SB					ND ND	N/A	+	Coarse sand, little gravel, yellowish brown, 10YR, 5/4, dry (FILL)	00000		1-
	1.2° to 2.2° (SB		- 3			ND	N/A	-5	Fine sand, little coal fragments, trace brick, black, dry (FILL)	100		2-
	-36-1.7-060607)				H	ND	N/A	- 7	Fine sand, trace coarse sand and gravel, very dusky red, 10R, 2.5/2, dry, dense @ 1.6' bgs inclusion of pale yellow, fine to coarse crystals (possibly sulfur?)	0000		3-
	3.2' to 5.2' (SB -36-4.2-060607)					ND	N/A		Fine to coarse sand, trace silt and gravel, reddish- yellow, 5YR, 5/6, some inclusions of more reddish color (FILL)	900000000000000000000000000000000000000		4-
									Fine sand, trace coarse sand and gravel, trace silt, dusky red, 10R, 3/6, mottle with pale yellow, 2.5Y, 8/3, saturated (FILL)	0000		
5	1	D	N/A	3.3/5.0	N/A	ND	N/A		Silt-like material (possibly gypsum fill?), white/pale brown, 10YR, 8/1/10YR, 8/2, saturated, soft (FILL)	0000		5-
	5.9° to 6.7° (SB -36-6.3-060607)		1			ND	N/A		Fine sand, little coal, gravel, coarse sand, brick, and cinder/slag, black, saturated (FILL)	0000	-	6-
						ND	N/A	-0	Silt, trace clay, organics, and fine sand, dark brown, 10YR, 3/3, saturated, soft, grades to more fine sand with depth (SILT)		ML	7-
												8-
								-				9-
10			ar - S						Bottom of boring @ 10 ft bgs			10-
												,,]

P.Feldspar	6
K-Feldspar	
Calcite	
Dolomite	
Siderite	
Halite	
Gypsum	
Hornblende	3.0
Augite	The state of the s
Sulfur	
Mullite	W
Magnetite	
Hematite	1
Goethite	
Akaganeite	
Pyrite	1
Jarosite	8
Kaolinite	trc
Chlorite	trc
Illite / Mica	1
Mixed-Layered	14 A 18
Illite/Smectite	1
Amorphous	55
TOTAL	100

MINERAL CONSTITUENTS Quartz Cristobalite

0-5 FT. BGS

SB-36-1.0-

MINERAL CONSTITUENTS	SB-36-1.7- 060607
Quartz	17
Cristobalite	11
P-Feldspar	6
K-Feldspar	0
Calcite	
Dolomite	5
Siderite	5
Halite	
Gypsum Hornblende	8
Augite Sulfur	14
Mullite	14
	40
Magnetite Hematite	10
	2
Goethite	
Akaganeite	45
Pyrite	15
Jarosite	2
Kaolinite	
Chlorite	
Illite / Mica	trc
Mixed-Layered	
Illite/Smectite	1
Amorphous	20
TOTAL	100



воттом

SOIL CORES/SAMPLED MATERIAL - 3.2-5.5 FT. BGS

MINERAL CONSTITUENTS	SB-36-4.2- 060607
Quartz.	16
Cristobalite	
P-Feldspar	1
K-Feldspar	trc
Calcite	CONTRACTOR OF STATE
Dolomite	
Siderite	2
Halite	
Gypsum	3
Hornblende	
Augite	
Sulfur	
Mullite	1.535
Magnetite	Maria Carrie
Hematite	23
Goethite	nulling good of
Akaganeite	de Tirling
Pyrite	1
Jarosite	31
Kaolinite	
Chlorite	
Illite / Mica	1
Mixed-Layered Illite/Smectite	2
Amorphous	20
TOTAL	100

MINERAL CONSTITUENTS	SB-36-6.3- 060607
Quartz	10
Cristobalite	3
P-Feldspar	
K-Feldspar	
Calcite	
Dolomite	No. of the second
Siderite	trc
Halite	
Gypsum	3
Hornblende	trc
Augite	
Sulfur	
Mullite	18
Magnetite	
Hematite	5
Goethite	
Akaganeite	
Pyrite	
Jarosite	1
Kaolinite	
Chlorite	ody/tol
Illite / Mica	trc
Mixed-Layered	CHANGE T
Illite/Smectite	trc
Amorphous	60
TOTAL	100

5-10 FT. BGS

SLAG/COAL - 5.9-6.7 FT. BGS



LEGEND:

N/A = not applicable

msl = mean sea level bgs = below ground surface ND = not detected NM = not measured

PROPORTIONS:
Trace: <5% Few: 16-30%
Little: 6-15% Some: 31-49%
Density designation based on blow counts for each 12" of penetration using a 140 lb. hammer w/30" drop

SAMPLE TYPES:
D: drive
W: washed
ST: Shelby Tube
A: Auger
HA: hand auger
C: cored
RC: rotasonic core
RC: rotasonic core

SOIL: GRANULAR SOILS DENSITY: PLASTIC SOILS DENSITY:
0-4: very loose
0-2: very soft
3-4: soft
4-3-4: soft
9-15: stiff
9-15: stiff
9-15: stiff
16-30: very stiff
9-30: hard
9-16: stiff
PROPATIONS:
Trace: <5% Few: 16-30%
Little: 6-15% Some: 31-49%
Using a 140 b. hammer wiso" drop
using a 140 b. hammer wiso" drop
and longer/ length of core in pieces 4"
and longer/ length of core in pieces 4"
and longer/ length of roin] x100

ROD (rock quality designation): reported in % = [length of core in pieces 4" and longer/ length of run] x100

NATIVE ORGANIC SILT - 6.7-10 FT. BGS



CH2IVIHILL

Cinder/Ash Investigation **Boring SB-36**

Quanta Resources Superfund Site - OU1 Edgewater, New Jersey

08/21/2007

	CH2MHILL
-	

BORING/WELL ID: SB-37

PROJECT NAME:	Quanta Resources	SURFACE ELEVATION: 6.9 ft. MSL	
LOCATION:	Quanta Resources Property	MEASURING POINT: N/A	
PROJECT NUMBER:	332898.QT.Q7.AS.CD.03	MEASURING POINT ELEVATION: N/A	
CLIENT:	Honeywell	TOTAL DEPTH: 10 ft.	
DRILLING CONTRAC	TOR: SGS Environmental Services, Inc.	FOREMAN: J Rousa	
DRILLING METHOD:	Direct Push	DRILLING EQUIPMENT: Geoprobe 6610	
SAMPLING METHOD:	5 ft. macrocore sampler	CH2M OBSERVER: A Harclerode	
START DATE:	06/06/2007	FINISH DATE: 06/06/2007	
NORTHING: 7190	07.72 EASTING: 633131.07	APPROX. DEPTH TO WATER: 2.9 ft. bgs 6/6/07	

	1.00		JES P(ft.)	_		SCREE		1	MATERIALS DESCRIPTION		BOL	WELL CONSTRUCTIO
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	DID	FID	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
-0		D	N/A	2.4/5.0	N/A	ND	N/A		Mix of silt, fine sand, and angular gravel/crushed rock, very dark brown, 7.5YR, 2.5/2, dry, dense (FILL)	000000		
						ND	N/A	-	Crushed rock/cobbles, some coarse sand/fine fine sub-rounded gravel, brown, 7.5YR, 4/4, saturated, dense (FILL)	000000000000000000000000000000000000000		2-
						ND	N/A		Silt with sub-rounded gravel, brown, 7.5YR, 4/4, saturated, dense (FILL)	00/		
	3.9' to 5.0' (SB-					ND	N/A		Medium sand, little slag, very dusky red, 2.5YR, 2.5/2, saturated, loose (FILL)	000		4-
	37-4.5-060607)					ND	N/A		Same as above but dark brown, 7.5YR, 4/4 (FILL)	00/	1	
5		D	N/A	1.1/5.0	N/A	23.2	N/A		Clayey peat, black, saturated, soft (CLAYEY PEAT)	-7-7	CL/PT	5-
										-7-		6-
								-0		-72-7		7-
							No.	-		-7-		8-
					19					-7-7		9-
										-7-7		
10				19					Bottom of boring @ 11 ft bgs		1	10-

LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable

SAMPLE TYPES: D: drive W: washed ST: Shelby Tube A: Auger HA: hand auger C: cored RC: rotasonic core

SOIL: GRANULAR SOILS DENSITY: PLASTIC SOILS DENSITY:

MOISTURE: 0-4: very loose 0-2: very soft dry 5-10: loose 3-4: soft moist 30-49: dense 9-15: stiff 50+: very dense 5-8: medium soft 9-15: stiff 50+: very dense 30: hard PROPORTIONS:

PROPORTIONS: Density designation based on blow counts for each 12* of pensetration using a 140 lb. hammer w/30* drop

Density designation based on blow counts for each 12* of pensetration using a 140 lb. hammer w/30* drop

0-5 FT. BGS TOP



MINERAL CONSTITUENTS	SB-37-4.5- 060607
Quartz	15
Cristobalite	
P-Feldspar	1
K-Feldspar	
Calcite	
Dolomite	THE REPORT OF
Siderite	
Halite	1
Gypsum	1
Hornblende	Name of the last
Augite	Jake Parkery
Sulfur	
Mullite	3
Magnetite	1
Hematite	54
Goethite	237 207 20 20 20
Akaganeite	District Confession
Pyrite	2
Jarosite	1
Kaolinite	NAME OF THE OWNER.
Chlorite	
Illite / Mica	1
Mixed-Layered Illite/Smectite	
Amorphous	20
TOTAL	100

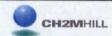


SAMPLED INTERVAL - REDDISH PURPLE MATERIAL - 3.9 - 5.0 FT. BGS

5-10 FT. BGS TOP



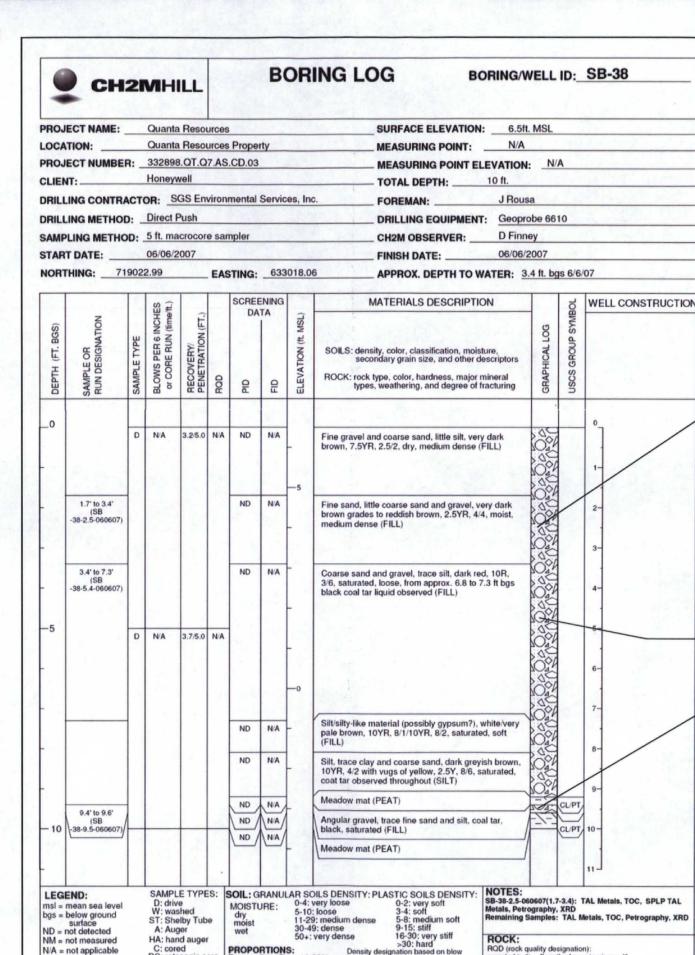
NO VISUAL EVIDENCE OF CINDER/SLAG - NATIVE CLAYEY PEAT



Cinder/Ash Investigation **Boring SB-37**

Quanta Resources Superfund Site – OU1 Edgewater, New Jersey

08/21/2007



Density designation based on blow

counts for each 12" of penetration

Little: 6-15% Some: 31-49% using a 140 lb. hammer w/30" drop

reported in % = [length of core in pieces 4*

and longer/ length of run] x100

Trace: <5% Few: 16-30%

BOTTOM SB-38-2.5-MINERAL 060607 CONSTITUENTS Quartz Cristobalite P-Feldspar trc K-Feldspar Calcite Dolomite Siderite Halite Gypsum Hornblende Augite Sulfur WASHED SAMPLE - 3.4-7.3 FT. BGS UNWASHED SAMPLE - 3.4-7.5 FT. BGS Mullite SB-38-5.4-Magnetite MINERAL 060607 Hematite CONSTITUENTS Goethite Quartz Akaganeite Cristobalite **Pyrite** P-Feldspar SB-38-9.5-**Jarosite** trc K-Feldspar MINERAL Kaolinite 060607 Calcite CONSTITUENTS Chlorite Dolomite Illite / Mica Quartz Siderite Mixed-Layered Cristobalite Halite P-Feldspar Illite/Smectite Gypsum trc K-Feldspar Hornblende TOTAL 100 Calcite Siderite 20 Mullite Halite Magnetite 22 Gypsum Hornblende Goethite Augite Akaganeite Pyrite Mullite Jarosite Magnetite Kaolinite Chlorite Goethite Illite / Mica Akaganeite Mixed-Layered Pyrite Illite/Smectite Jarosite **Amorphous** Kaolinite TOTAL 100 Chlorite Illite / Mica Mixed-Layered Illite/Smectite Amorphous NAPL - 8.1-9.2 FT. BGS TOTAL 100 5-10 FT. BGS TOP воттом SB-38 (5'-10') CH2WHILL Cinder/Ash Investigation **Boring SB-38** Quanta Resources Superfund Site - OU1 **Edgewater, New Jersey** WHITE SILT-LIKE MATERIAL - 7.3-8.1 FT. BGS

08/21/2007

CUT BANK AT NORTHERN LEVER BROS. SHORELINE





GLASSY SLAG IN SHORELINE SURFACE MATERIAL

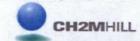


SHORELINE GRAB SAMPLE OF GLASSY SLAG (SLG-01)



GLASSY SLAG

MINERAL CONSTITUENTS	SLG-01-0- 060407
Quartz	
Cristobalite	
P-Feldspar	Y. STATE STATE
K-Feldspar	
Calcite	
Dolomite	
Siderite	
Halite	
Gypsum	
Hornblende	
Augite	
Sulfur	
Mullite	19
Magnetite	6
Hematite	TO ME TO LOCAL
Goethite	
Akaganeite	
Pyrite	
Jarosite	
Kaolinite	
Chlorite	
Illite / Mica	1
Mixed-Layered	
Illite/Smectite	1
Amorphous	73
TOTAL	100



Cinder/Ash Investigation Shoreline Slag – SLG-01

Quanta Resources Superfund Site – OU1 Edgewater, New Jersey

August 21, 2007

Final Results of X-Ray Diffraction & Thin Section Petrographic Analysis

CH2M Hill Quanta Resources Project Edgewater, NJ

Mineralogy, Inc. Job No.: 27291

27291-07	SB-30	2.5-3.5	SB-30-2.5-060507
27291-08	SB-30	4.0-15	SB-30-9.5-060507
27291-09	SB-37		SB-37-4.5-060607
27291-10	SB-36	0.8-1.2	SB-36-1.0-060607
27291-11	SB-36	1.2-2.2	SB-36-1.7-060607
27291-12	SB-36	3.2-5.2	SB-36-4.2-060607
27291-13	SB-36	5.9-6.7	SB-36-6.3-060607
27291-14*	SB-29	5.0-8.4	SB-29-6.7-060507
27291-15	SLG-01	0.0-0.2	SLG-01-0-060407
•			4
27291-16	SB-38	1.7-3.4	SB-38-2.5-060607
27291-17	SB-38	3.4-7.3	SB-38-5.4-060607
27291-18	SB-38	9.4-9.6	SB-38-9.5-060607

^{*} Samples archived for possible future analysis

It has been our pleasure to participate in the evaluation of these borehole specimens, and it is our hope that this data will contribute to an effective characterization of the mineralogy & texture of the synthetic and geologic materials at the Quanta Resources - Edgewater, NJ site. The conditions under which this report is presented are summarized immediately following this letter. If you should have any questions regarding these results, or if I can be of further service, please don't hesitate to call.

Sincerely,

Timothy B. Murphy Mineralogy, Inc.

Quanta Resources Project - Edgewater, NJ SB-34C-1.3-060407

Mineralogy, Inc. File No.: 27291-01

LITHOLOGIC CLASSIFICATION: Litharenitic Pebble Conglomerate

TEXTURAL DATA: The interval is comprised of pebble-sized fragments of glass-rich slag. The pebbles are very poorly sorted & angular – the pebbles comprise 100% of the grain volume for this interval.

Mean grain diameter:

 $\sim 11.7 \text{ mm}^{-1}$

Maximum grain diameter:

>15 mm

THIN SECTION FABRIC:

This pebble conglomerate sample is massively bedded, unconsolidated and completely disaggregated. The slag particles are locally encrusted with traces of iron oxide. Minor amounts of detrital matrix are present as infiltrated clay that is commonly visible within intraparticle gasentrapment voids.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Glass & Fe-oxide-rich slag fragments – Glass-rich slag fragments – with common inclusions of mullite crystals and Fe-oxide particles – the light gray, silica-rich slag particles are locally porous and exhibit common gas entrapment vesicles. The black glass-rich slag particles contain a relatively larger proportion of iron and/or carbon relative to the mullite-rich particles and smaller concentrations of intraparticle porosity. One of the slag fragments exhibits a groundmass of dark brown isotropic glass, with an intricate network of inclusions filled with pyroxene (probably augite).

Quartz - monocrystalline

CEMENTS & MATRIX CONSTITUENTS:

Hematite occurs as an accessory cement type that marginally encrusts the slag particles. Hematite is also present as pore-lining cement within selected gas-entrapment voids (see Figure I). Traces of finely crystalline pyrite (estimated @ < 0.3%) were detected in one of the gas vesicles. Infiltrated detrital clay is locally present, occurring as clusters of matrix that are locally admixed with silt to sand-sized glass fragments. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of a mixture of mixed-layered illite/smectite (~1%), and traces of illite/mica.

PORE SYSTEM:

This conglomerate sample is unconsolidated and partially disaggregated, thus the thin section pore volume includes large volumes of artifact porosity. Intraparticle void space is present in association with the slag particles (~25-30%).

Quanta Resources Project - Edgewater, NJ SB-28-6.3-060507

5.6-7.0 ft.

Mineralogy, Inc. File No.: 27291-03

LITHOLOGIC CLASSIFICATION: Litharenitic Sandy Pebble Conglomerate **TEXTURAL DATA:** Coarse sand to pebble-sized, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for >60% of the grain volume.

Mean grain diameter:

~ 1.56 mm

Maximum grain diameter:

11.7 mm

THIN SECTION FABRIC:

This sandy pebble conglomerate sample is massively bedded, unconsolidated and partially disaggregated. Portions of the framework are weakly cemented with a mixture of iron oxide + bitumen. The bitumen particles & grain coatings are commonly flanked by halos of marginally solubilized oil that are locally diffused into the blue-dyed impregnation epoxy.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Glass-rich slag fragments – black glass-rich slag particles that contain a relatively large proportion of iron and/or carbon relative to the light gray, mullite-rich glass slag particles. The light gray, silica-rich slag particles are locally porous and exhibit common gas entrapment vesicles.

Plutonic RF's – medium crystalline gabbro fragments dominated by feldspar + augite + magnetite

Bitumen / asphalt particles – black in transmitted and reflected light with common hydrocarbon diffusion halos preserved in the impregnating epoxy.

Recycled concrete fragments – the concrete particles are cemented with calcium silicate hydrate + calcite, with major aggregate types that include quartz-rich sand and minor gabbro rock fragments.

Quartz - monocrystalline + polycrystalline varieties

Feldspar – plagioclase + subordinate k-feldspar

CEMENTS & MATRIX CONSTITUENTS:

Hematite & bitumen are present as irregularly distributed intergranular cements. Minor amounts of detrital matrix are present as infiltrated clay that is commonly visible within gasentrapment voids. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of a mixture of illite/mica (~1%), and mixed-layered illite/smectite (~1%).

PORE SYSTEM:

This conglomerate sample is unconsolidated and partially disaggregated, thus the thin section pore volume includes large volumes of artifact porosity. Consolidated portions of the fabric exhibit modest volumes of preserved intergranular macroporosity (~10-17%). Some intraparticle void space is present in association with the slag particles (~trace-8%).

Quanta Resources Project - Edgewater, NJ SB-30-2.5-060507

1.5-3.5 ft.

Mineralogy, Inc. File No.: 27291-07

LITHOLOGIC CLASSIFICATION: Litharenitic Sandy Pebble Conglomerate

TEXTURAL DATA: Coarse-grained, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for >50% of the grain volume.

Mean grain diameter:

~ 1.69 mm

Maximum grain diameter:

8.5 mm

THIN SECTION FABRIC:

This sandy pebble conglomerate sample is massively bedded, unconsolidated and partially disaggregated. Portions of the framework are cemented with a mixture of iron oxide + bitumen. Minor amounts of detrital matrix are present as infiltrated clay that is commonly visible within gas-entrapment voids. The bitumen particles & grain coatings are commonly flanked by halos of marginally solubilized oil that are locally diffused into the blue-dyed impregnation epoxy.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Plutonic RF's – medium crystalline gabbro fragments dominated by feldspar + augite + magnetite

Glass-rich slag fragments – black, glass & Fe-oxide-rich slag particles that contain a relatively large proportion of iron and/or carbon relative to the light gray, mullite-rich glass slag particles. The light gray, silica-rich slag particles are locally porous and exhibit minor amounts of gas entrapment vesicles. One slag particle included in this sample exhibits radiating starshaped crystal clusters (probably mullite; see Figure V; upper-left photo).

Bitumen / asphalt particles – black in transmitted and reflected light with common hydrocarbon diffusion halos preserved in the impregnating epoxy.

Quartz - monocrystalline + polycrystalline varieties

Feldspar – plagioclase + subordinate k-feldspar

Metaquartzite RFs

CEMENTS & MATRIX CONSTITUENTS:

Hematite & bitumen are present as irregularly distributed intergranular cements. Infiltrated detrital clay is locally present, occurring as clusters of matrix that are locally stained with hydrocarbons. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of a mixture of mixed-layered illite/smectite (~3%), illite/mica (~1%), kaolinite (~1%), and traces of chlorite.

PORE SYSTEM:

This conglomerate sample is unconsolidated and partially disaggregated, thus the thin section pore volume includes large volumes of artifact porosity. Relatively well-preserved or intact sediment aggregates exhibit ~ 5-15%. Intraparticle void space is present in association with the slag particles (~trace-5%).

Quanta Resources Project - Edgewater, NJ SB-37-4.5-060607

Mineralogy, Inc. File No.: 27291-09

LITHOLOGIC CLASSIFICATION: Litharenitic Sandy Pebble Conglomerate

TEXTURAL DATA: Coarse-grained, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for >55-60% of the grain volume.

Mean grain diameter:

~ 1.63 mm

Maximum grain diameter:

16.2 mm

THIN SECTION FABRIC:

This sandy pebble conglomerate sample is massively bedded, unconsolidated and partially disaggregated. Portions of the framework are cemented with iron oxide (mostly hematite), coupled with minor to trace amounts of very finely crystalline pyrite. Minor amounts of detrital matrix are present as infiltrated clay. The clay matrix is irregularly distributed within some of the intergranular voids. Traces of bitumen are present coating the particle surfaces in portions of this sandstone. As described in other samples from this sample suite, the bitumen coatings are commonly flanked by halos of solubilized oil that has diffused into the blue-dyed impregnation epoxy.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Recycled concrete fragments – the concrete particles are cemented with calcium silicate hydrate + calcite, with major aggregate types that include quartz-rich sand and plutonic rock fragments.

Plutonic RF's – medium crystalline gabbro fragments dominated by feldspar + augite + magnetite

Glass-rich slag fragments – black, glass & Fe-oxide-rich slag particles that contain a relatively large proportion of hematite, with minor amounts of mullite +/- carbon

Quartz - monocrystalline + minor polycrystalline quartz

Feldspar – plagioclase + minor k-feldspar

Augite

CEMENTS & MATRIX CONSTITUENTS:

Hematite & minor amounts of pyrite are present as the principal intergranular cements for this interval. The pyrite commonly occurs as minute (very finely crystalline) clusters of cement that are locally admixed with the more abundant hematite phase. In addition to the pyrite cement noted above, minor amounts of jarosite are also reported in the XRD summary for this sample. Infiltrated detrital clay (illite) accounts for $\sim 1\%$ of the grain volume in this sample, occurring as diffuse & microporous clusters of matrix that are locally co-mingled with the hematite cement. **PORE SYSTEM:**

This conglomerate sample is unconsolidated and partially disaggregated, thus the thin section pore volume includes large volumes of artifact porosity. Relatively well-preserved portions of the sedimentary fabric contain ~5-15% intergranular porosity, with selected glass-rich slag particles containing up to 10% intraparticle void space.

Quanta Resources Project - Edgewater, NJ SB-36-1.7-060607

1.2-2.2 ft.

Mineralogy, Inc. File No.: 27291-11

LITHOLOGIC CLASSIFICATION: Litharenitic Sandstone

TEXTURAL DATA: Coarse-grained, very poorly sorted & angular to subangular—the thin section contains scattered granules and pebbles that are estimated to account for ~10-20% of the grain volume.

Mean grain diameter:

~ 0.78 mm

Maximum grain diameter:

5.2 mm

THIN SECTION FABRIC:

This sandstone sample is massively bedded, & weakly consolidated, with a mixture of iron oxide, pyrite & bitumen serving as intergranular cements. The bitumen particles & grain-coatings are commonly flanked by halos of solubilized oil that have diffused into the blue-dyed impregnation epoxy.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Glass-rich slag fragments – black, glass & Fe-rich slag particles that contain moderate volumes of vesicular porosity

Bitumen / asphalt_particles – black in transmitted and reflected light with localized hydrocarbon diffusion halos preserved in the impregnating epoxy.

Quartz monocrystalline + minor polycrystalline quartz

Feldspar – plagioclase + minor k-feldspar

Matrix-rich Sandstone RFs

Metamorphic RFs

Cellulose particles – probably woody plant fragments

CEMENTS & MATRIX CONSTITUENTS:

The sandstone is weakly cemented with a mixture of iron oxide, pyrite & bitumen. Pyrite and minor amounts of jarosite occur as irregularly distributed intergranular & void-filling/replacement cements associated with the opaque slag particles. Minor to trace amounts of detrital matrix are present as infiltrated clay. Infiltrated detrital clay is locally present, occurring as clusters of matrix that are locally admixed with Fe-oxide &/or hydrocarbons. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of a mixture of illite/mica (~1%), and traces of mixed-layered illite/smectite.

PORE SYSTEM:

This sandstone sample is weakly consolidated and partially disaggregated, thus the thin section pore volume includes some artifact porosity. Relatively well-preserved portions of the sedimentary fabric contain ~10-15% intergranular porosity, with selected slag particles containing up to 8% intraparticle void space.

Quanta Resources Project - Edgewater, NJ SB-36-6.3-060607

Mineralogy, Inc. File No.: 27291-13

LITHOLOGIC CLASSIFICATION: Litharenitic Pebble Conglomerate

TEXTURAL DATA: The interval is comprised of pebble-sized fragments of glass-rich slag. The pebbles are very poorly sorted & angular – the pebbles comprise 100% of the grain volume for this interval.

Mean grain diameter:

~ 8.5 mm

Maximum grain diameter:

17.1 mm

THIN SECTION FABRIC:

This pebble conglomerate sample is massively bedded, unconsolidated and completely disaggregated. The slag particles are locally encrusted with traces of iron oxide. Traces of detrital matrix are present as infiltrated clay that is commonly visible within intraparticle gasentrapment voids.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Glass & Fe-oxide-rich slag fragments – Glass-rich slag fragments – with common inclusions of mullite crystals and Fe-oxide particles – the light gray, silica-rich slag particles are locally porous and exhibit common gas entrapment vesicles. The black glass-rich slag particles contain a relatively larger proportion of iron and/or carbon relative to the mullite-rich particles and smaller concentrations of intraparticle porosity. One of the slag fragments exhibits a groundmass of black glass, with an abundance of shatter crack porosity.

Quartz - monocrystalline

CEMENTS & MATRIX CONSTITUENTS:

Hematite occurs as an accessory cement type that marginally encrusts the slag particles. Hematite is also present as pore-lining cement within selected gas-entrapment voids. Traces of infiltrated detrital clay are locally present, occurring as clusters of matrix that are locally admixed with silt to sand-sized glass fragments. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of traces of mixed-layered illite/smectite and illite/mica.

PORE SYSTEM:

This conglomerate sample is unconsolidated and partially disaggregated, thus the thin section pore volume includes large volumes of artifact porosity. Intraparticle void space is present in association with the slag particles (~2-15%).

Quanta Resources Project - Edgewater, NJ SB-38-2.5-060607

1.7-3.4 ft.

Mineralogy, Inc. File No.: 27291-16

LITHOLOGIC CLASSIFICATION: Litharenitic Sandy Pebble Conglomerate

TEXTURAL DATA: Coarse sand to pebble-sized, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for >40% of the grain volume.

Mean grain diameter:

~ 1.82 mm

Maximum grain diameter:

4.49 mm

THIN SECTION FABRIC:

This sandy pebble conglomerate sample is massively bedded, and cemented with hematite. The individual Fe-oxide-rich slag particles contain significant amounts of intraparticle void space.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Iron oxide-rich slag fragments – black, Fe-oxide-rich slag particles that are dominated by hematite, together with subordinate amounts of light gray, mullite-rich glass slag particles. The slag particles are locally porous and exhibit common gas entrapment vesicles.

Iron oxide fragments - magnetite + hematite dominated grains

Quartz - monocrystalline + polycrystalline varieties

Gypsum-rich RFs

Feldspar

CEMENTS & MATRIX CONSTITUENTS:

Hematite is ubiquitous as a grain and intergranular cement constituent. Based on the XRD summary, hematite accounts for $\sim 71\%$ of the grain volume. Minor amounts of pyrite are present as secondary void-filling cement associated with selected slag particles. Traces of illite were identified in the XRD summary; however, no clay matrix material was detected in the thin section evaluation of this interval.

PORE SYSTEM:

Relatively well-preserved portions of the sedimentary fabric contain $\sim 12-17\%$ intergranular and intraparticle porosity. A few of the slag particles are estimated to contain > 25% void space.

Quanta Resources Project - Edgewater, NJ SB-38-9.5-060607

9.4-9.6 ft.

Mineralogy, Inc. File No.: 27291-18

LITHOLOGIC CLASSIFICATION: Litharenitic Sandy Pebble Conglomerate

TEXTURAL DATA: Coarse sand to pebble-sized, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for >80% of the grain volume.

Mean grain diameter:

~ 4.1 mm

Maximum grain diameter:

9.0 mm

THIN SECTION FABRIC:

This sandy pebble conglomerate sample is massively bedded, and disaggregated. Scattered grains and pebbles are locally encrusted with iron oxide + bitumen. The bitumen particles & grain coatings are commonly flanked by halos of marginally solubilized oil that are locally diffused into the blue-dyed impregnation epoxy. The individual slag particles contain significant amounts of void-filling gypsum and/or siderite cement.

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Glass & mullite-rich slag fragments – black slag particles dominated by opaque glass + mullite. The intraparticle voids within several of the slag particles are cemented with gypsum, cristobalite, and/or siderite.

Bitumen / asphalt fragments (& grain-coatings) – diffusion halos evident throughout the sample fabric.

Quartz – monocrystalline + polycrystalline varieties Feldspar

CEMENTS & MATRIX CONSTITUENTS:

Gypsum is the most abundant intraparticle cement phase. One of the pebble-sized slag fragments contains significant amounts of grain-replacement / void-filling siderite. Cristobalite occurs as a relatively minor void-filling cement phase. Bitumen is evident throughout the sample, occurring as discrete particles of hydrocarbon material that have locally encrusted the slag fragments. Minor amounts of jarosite (~1%) were detected in the XRD analysis of this sample; however, no jarosite was detected in the thin section analysis. Based on the x-ray diffraction data set (see Table I), the clay suite is comprised of moderate amounts of mixed-layered illite/smectite (~2%).

PORE SYSTEM:

Minor amounts of preserved intraparticle porosity (~5-18%) are associated with the slag particles.

MINERALOGY, INC.

3228 East 15th St. - Tulsa, OK – 74104.5252 *Phone:* 918.744.8284 - Fax: 918.743.7460 Email: tmurphy@mineralogy-inc.com

August 14, 2007

CH2M Hill

Attn.: Ms. Jennifer Sims 1717 Arch St., Suite 4400 Philadelphia, PA 19103

CC: Ms. Amy Klopper Amy.klopper@ch2m.com
Jennifer.simms@ch2m.com
David.finney@ch2m.com

RE: Final Results of Unconsolidated Sediment Analysis

Quanta Resources Project; Edgewater, NJ

Appendix I

Mineralogy, Inc. Job No.: 27291

Ladies & Gentlemen:

This report provides the final results of the x-ray diffraction (XRD), and thin section petrographic analysis performed for 3 unconsolidated sediment (grab) samples provided from two shallow bore holes within the above-captioned project area in Edgewater, NJ. The following table provides an inventory of the lab sample ID's, well ID's, and sampling depths for the three sediment samples included in this addendum. These samples were archived for possible future analysis & omitted from the original report for this study area (dated 8/3/07), with the current evaluation subsequently authorized on 8/7/07.

MI Lab ID	<u>Well / Location</u> <u>ID</u>	<u>Depth (ft.)</u>	Field Sample ID
27291-04	SB-29	0.8-2.9	SB-29-1.9-060507
27291-05	SB-31	0.0-2.2	SB-31-1.1-060507
27291-14	SB-29	5.0-8.4	SB-29-6.7-060507

CONDITIONS AND QUALIFICATIONS

Mineralogy, Inc. will endeavor to provide accurate and reliable laboratory measurements of the samples provided by the client. The results of any x-ray diffraction, petrographic or core analysis test are necessarily influenced by the condition and selection of the samples to be analyzed. It should be recognized that geological samples are commonly heterogeneous and lack uniform properties. Mineralogical, geochemical and/or petrographic data obtained for a specific sample provides compositional data pertinent to that specific sampling location. Such "site-specific data" may fail to provide adequate characterization of the range of compositional variability possible within a given project area, thus the "projection" of these laboratory findings and values to adjoining, "un-tested" areas of the formation or project area is inherently risky, and exceeds the scope of the laboratory work request. Hence, Mineralogy, Inc. shall not assume any liability risk or responsibility for any loss or potential failure associated with the application of "site or sample-specific laboratory data" to "un-tested" areas of the formation or project area. Unless otherwise directed, the samples selected for analysis will be chosen to reflect a visually representative portion of the bulk sample submitted for analysis. Where provided, the interpretation of x-ray diffraction, petrographic or core analysis results constitutes the best geological judgment of Mineralogy, Inc., and is subject to the sampling limitations described above, and the detection limits inherent to semi-quantitative and/or qualitative mineralogical and microscopic analysis. Mineralogy, Inc. assumes no responsibility nor offers any guarantee of the productivity, suitability or performance of any oil or gas well, hydrocarbon recovery process, dimension stone, and/or ore material based upon the data or conclusions presented in this report.

Quanta Resources Project - Edgewater, NJ SB-31-1.1-060507 0.8-2.9 ft.

Mineralogy, Inc. File No.: 27291-05

LITHOLOGIC CLASSIFICATION: Silt & Granule-Rich Litharenitic Sandstone *TEXTURAL DATA:* Medium sand-sized, silt-rich, very poorly sorted & angular – the thin section contains scattered granules and pebbles that are estimated to account for ~10-15% of the grain volume.

Mean grain diameter:

 $\sim 0.17 \text{ mm}$

Maximum grain diameter:

4.81 mm

THIN SECTION FABRIC:

This sandstone sample is massively bedded, unconsolidated and completely disaggregated. The specimen contains scattered concentrations of bitumen or asphalt flanked by halos of marginally solubilized oil (diffused into the blue-dyed impregnation epoxy).

FRAMEWORK GRAIN CONSTITUENTS:

The detrital mineralogy includes the following grain species (including synthetic & naturally occurring sediment types), listed in order of decreasing relative abundance:

Quartz – monocrystalline + polycrystalline varieties

Feldspar – plagioclase + subordinate k-feldspar

Glass & iron-rich slag fragments – includes black slag particles that contain significant concentrations of iron oxide and/or carbon relative to the light gray, mullite-rich glass slag particles. The light gray, silica-rich slag particles are locally porous and exhibit common gas entrapment vesicles. Several of the slag particles are partially replaced with siderite cement.

Plutonic RF's – medium crystalline gabbro fragments dominated by feldspar + augite + magnetite

Augite ·

Shale

Sandstone - iron oxide-cemented

Bitumen / asphalt particles – black in transmitted and reflected light with common hydrocarbon diffusion halos preserved in the impregnating epoxy.

CEMENTS & MATRIX CONSTITUENTS:

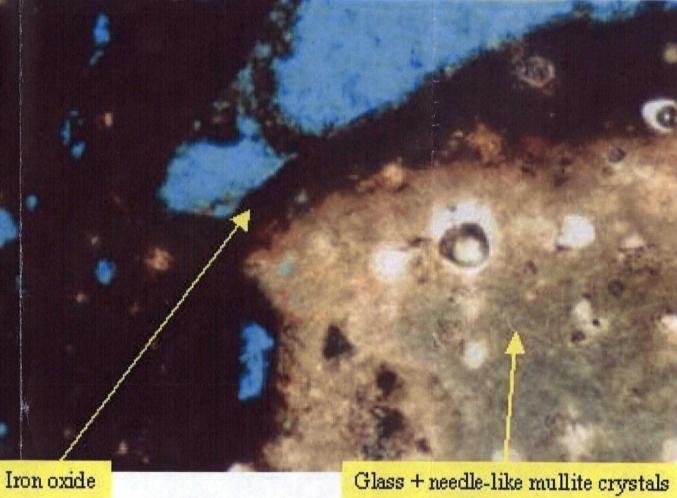
Minor amounts of detrital matrix are present as infiltrated clay occupying scattered gasentrapment voids within selected slag particles. Authigenic clay is also locally present as replacement clay associated with leached feldspar grains & plutonic RFs. Based on the x-ray diffraction data set (see Table II), the clay suite is comprised of a mixture of illite/mica (~3%), mixed-layered illite/smectite (~1%), and traces of kaolinite.

PORE SYSTEM:

This sandstone sample is unconsolidated and disaggregated, thus the thin section is dominated by intergranular artifact porosity. Some intraparticle void space is present in association with the slag particles (~trace-10%).

Figure I Thin Section Photomicroscopy

125 uM (10X) UXN



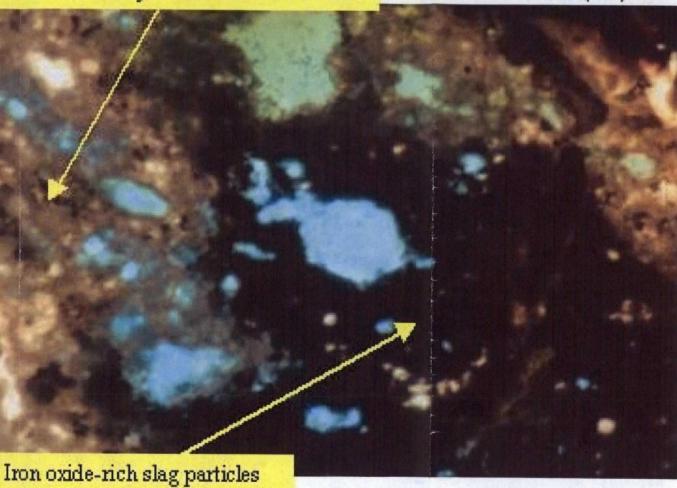
CH2M Hill

Location: Edgewater, NJ Sample ID: SB-34C-1.3-060407

Figure II Thin Section Photomicroscopy

Glass + microcrystalline fibers of mullite

125 uM (10X) UXN



CH2M Hill

Location: Edgewater, NJ Sample ID: SB-28-3.4-060507

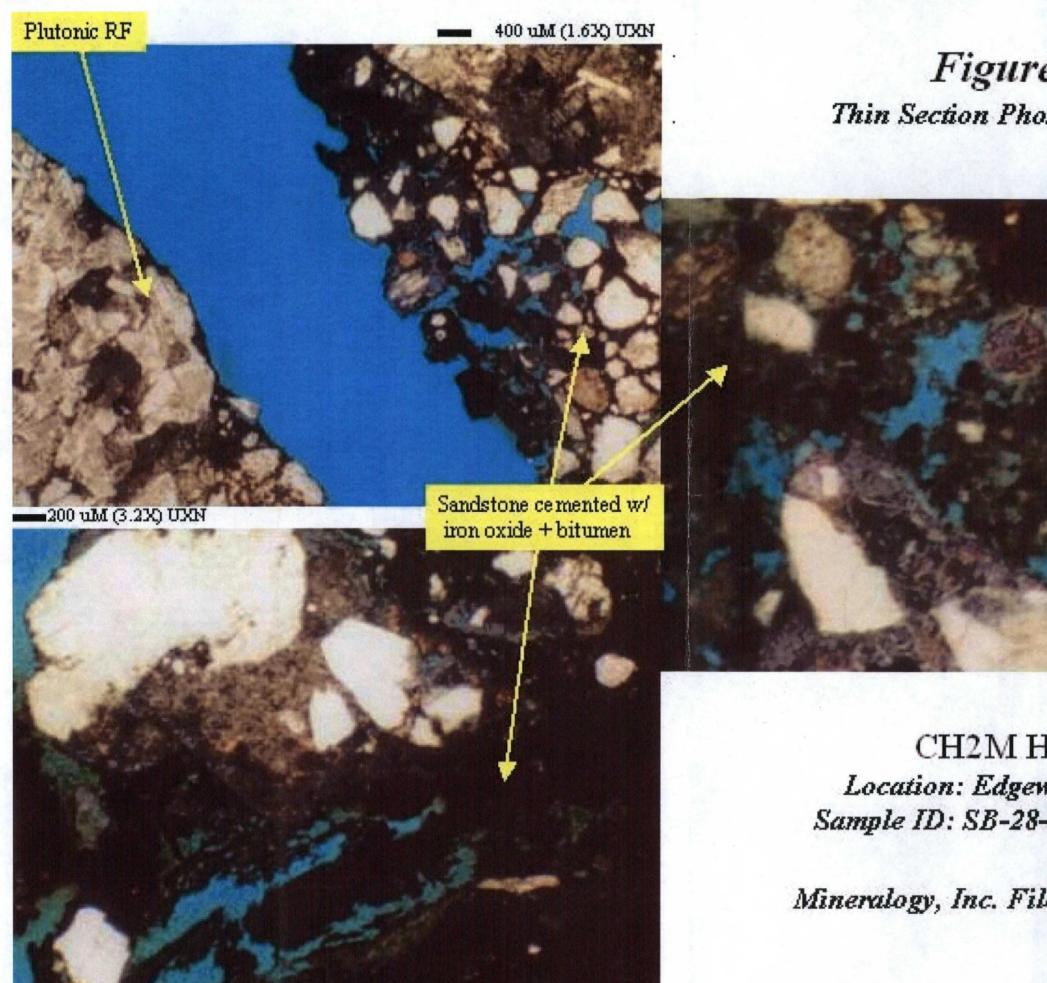


Figure III Thin Section Photomicroscopy

125 uM (10X) UXN

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-28-6.3-060507

Figure IV Thin Section Photomicroscopy

125 uM (10X) UXN



Glassy slag particle w/ fibrous mullite crystals

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-31-6.0-060507

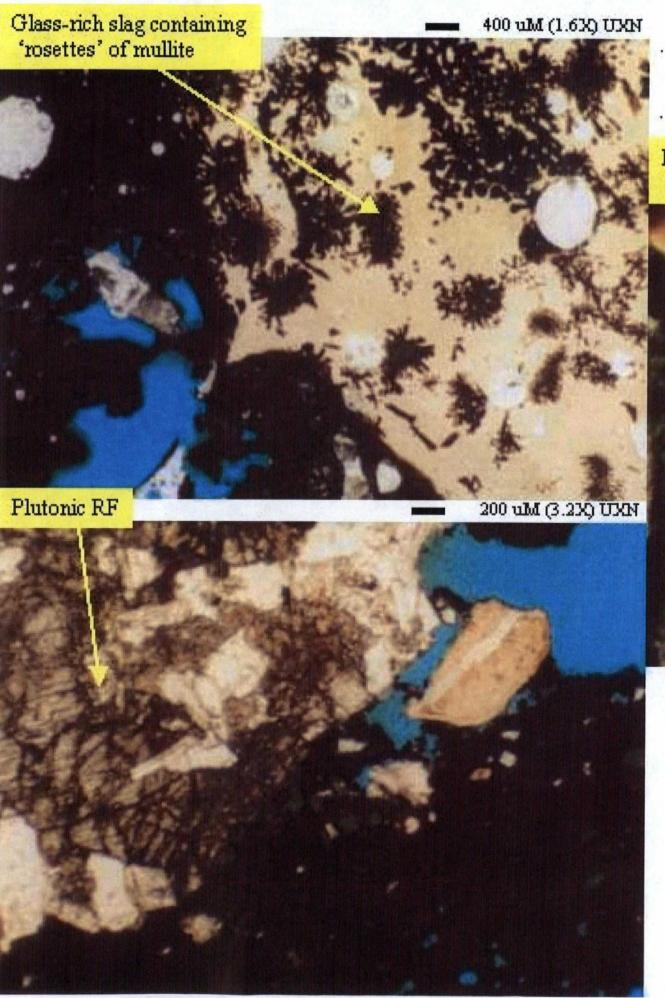
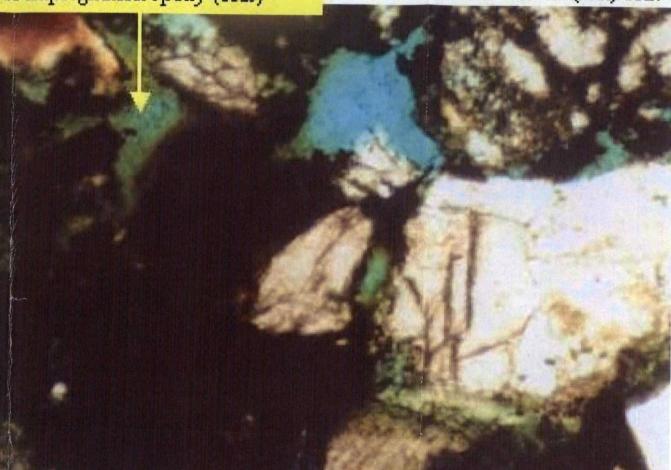


Figure V Thin Section Photomicroscopy

Hydrocarbon discoloration (green) of impregnation epoxy (blue)

125 uM (103X) UXN



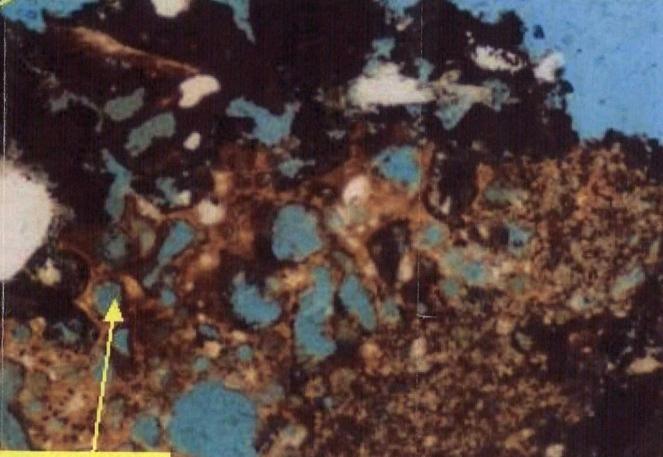
CH2M Hill

Location: Edgewater, NJ Sample ID: SB-30-2.5-060507

Plutonic RF ■ 200 uM (3.2X) UXN Iron-oxide & glass-rich slag particles

Figure VI Thin Section Photomicroscopy

125 uM (10X) UXN



Vesicular porosity

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-30-9.5-060507

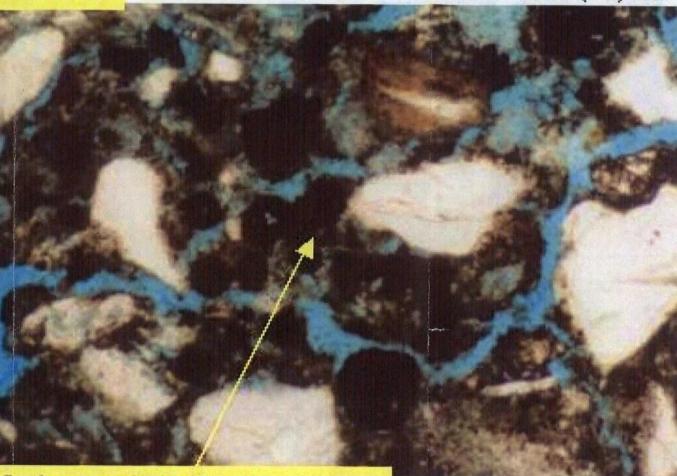
400 uM (1.6X) UXN 200 uM (3.2X) UXN Iron-oxide & glass-rich slag particles

Plutonic RF

Figure VII Thin Section Photomicroscopy

Plutonic RF

125 uM (103X) UXN



Sand cemented with iron oxide + bitumen

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-37-4.5-060507

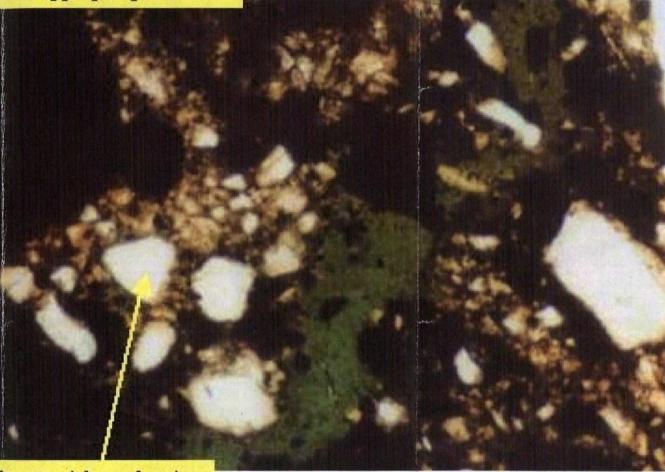
Hydrocarbon discoloration (green) ■200 uM (3.2%) UXN of impregnation epoxy (blue) Glass + mullite-rich slag particle

Figure VIII

Thin Section Photomicroscopy

Fe-oxide, glass & bitumen -rich aggregate particles

125 uM (103X) UXN



Quartz-rich sand grains

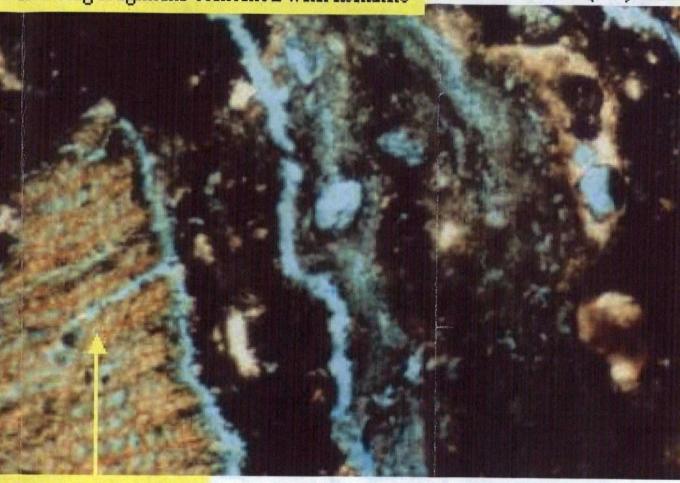
CH2M Hill

Location: Edgewater, NJ Sample ID: SB-36-1.0-060607

Figure IX Thin Section Photomicroscopy

Aggregate particles comprised of Fe-oxide + glass-rich slag fragments cemented with hematite

125 uM (10X) UXN



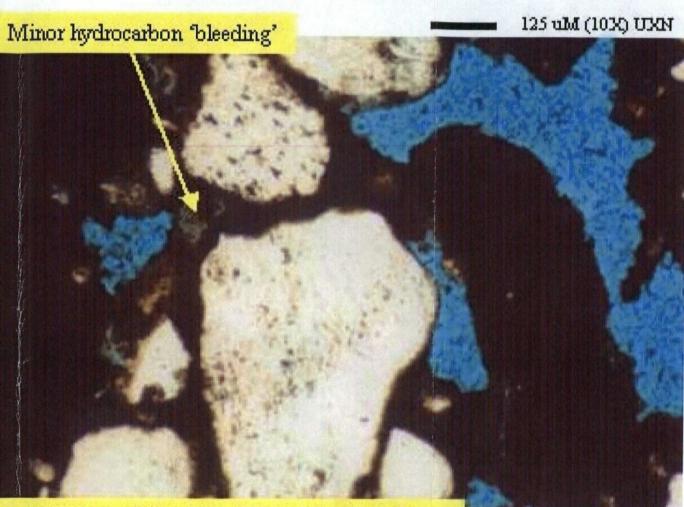
Cellulose? fragment

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-36-1.7-060607

Hematite cement

Figure X Thin Section Photomicroscopy



Aggregate particles comprised of quartz + glass + Fe-oxide slag fragments cemented with hematite

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-36-4.2-060607

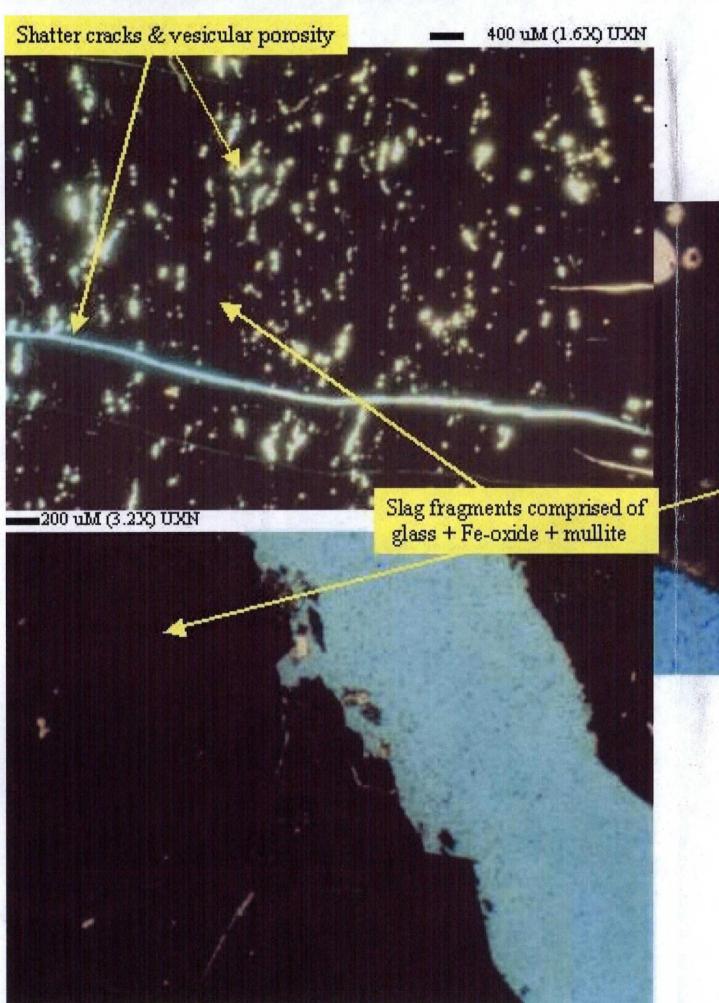
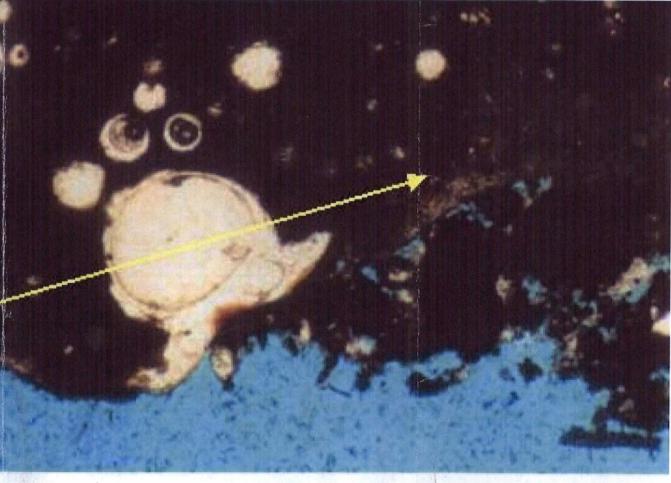


Figure XI Thin Section Photomicroscopy

■ 125 uM (10X) UXN

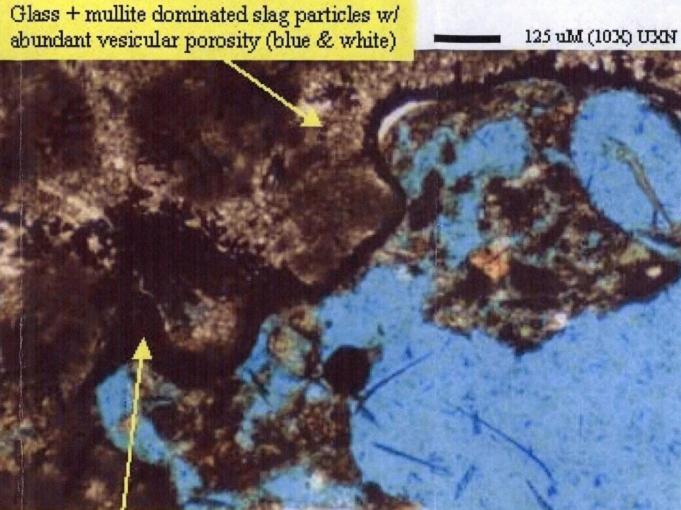


CH2M Hill

Location: Edgewater, NJ Sample ID: SB-36-6.3-060607

Figure XII

Thin Section Photomicroscopy



Fe-oxide cement (black)

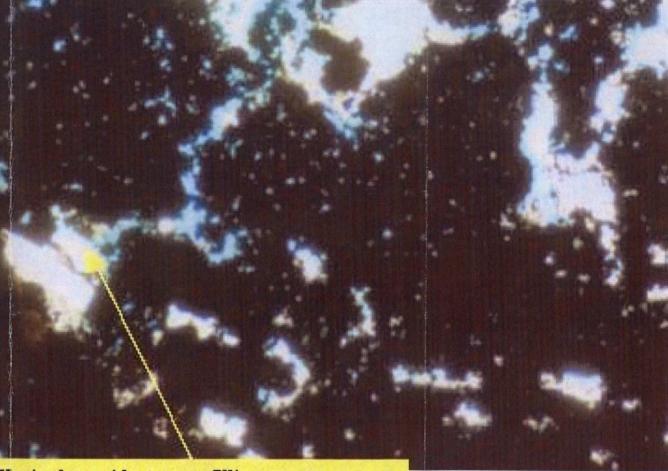
CH2M Hill

Location: Edgewater, NJ Sample ID: SLG-01-0-060407

Hematite-rich slag particles w/ 200 uM (3.2X) UXN abundant vesicular porosity Glass + mullite

Figure XIV Thin Section Photomicroscopy

125 uM (10X) UXN



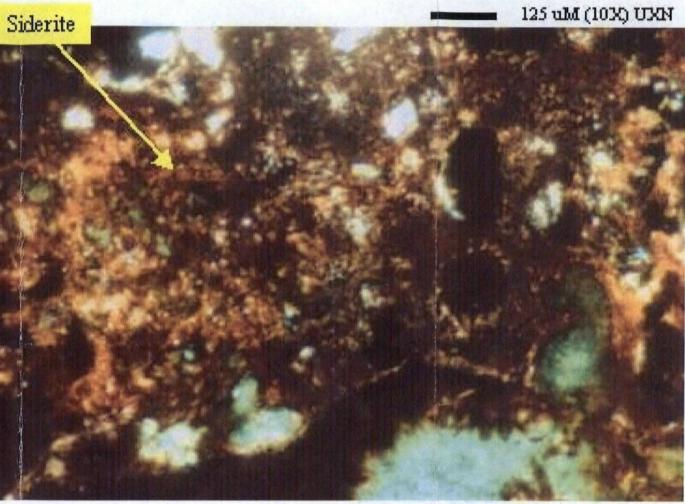
Vesicular voids + pore-filling quartz cement

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-38-5.4-060607

400 uM (1.6X) UXN Hydrocarbon discoloration (green) 200 uM (3.2X) UXN of impregnation epoxy (blue) Gypsum

Figure XV Thin Section Photomicroscopy



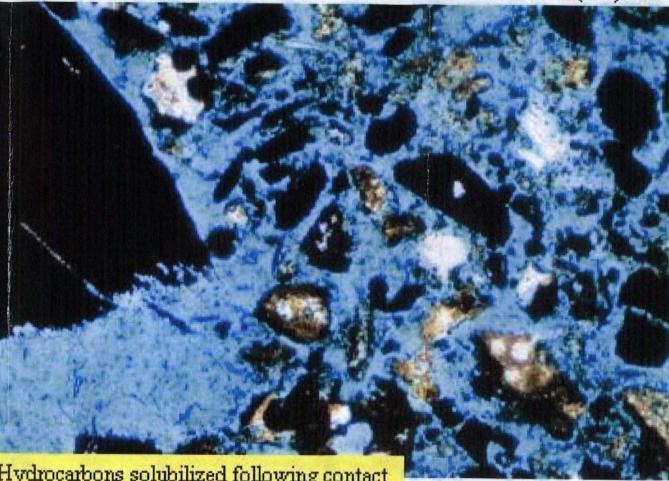
CH2M Hill

Location: Edgewater, NJ Sample ID: SB-38-9.5-060607

400 uM (1.6X) UXN Iron-rich glass slag = 200 uM (3.2X) UXN

Figure XVI Thin Section Photomicroscopy

125 uM (10X) UXN



Hydrocarbons solubilized following contact with the impregnation epoxy (green)

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-29-1.9-060507

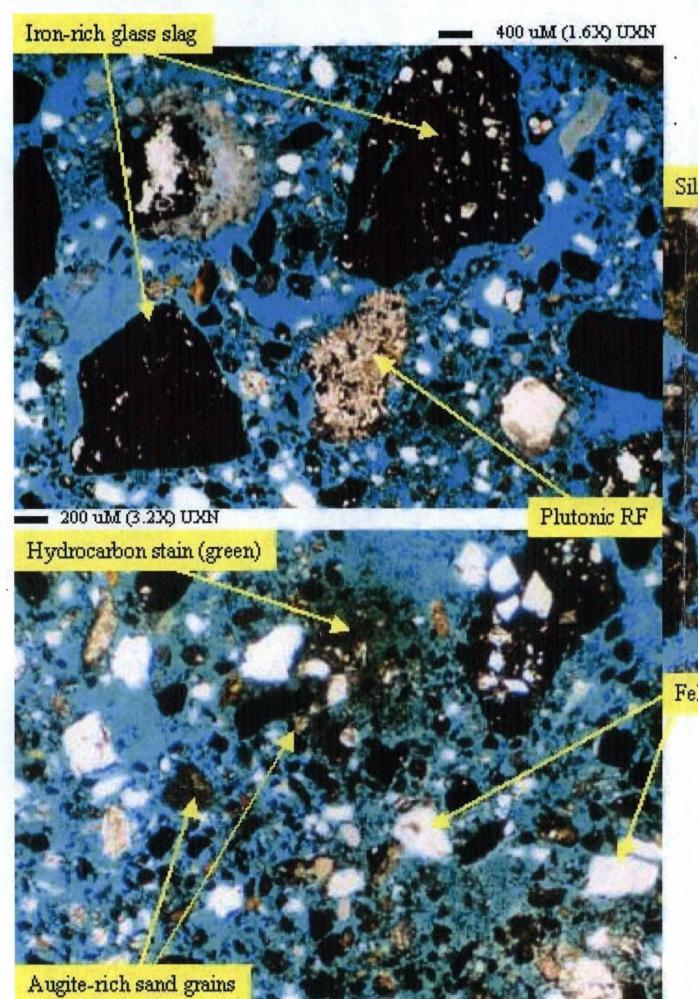
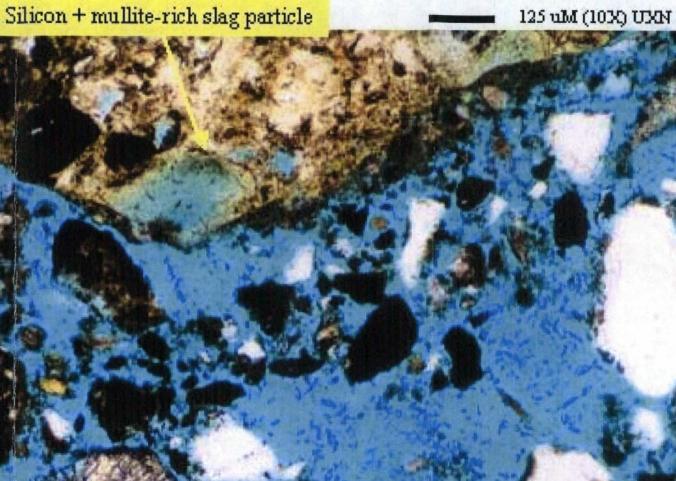


Figure XVII

Thin Section Photomicroscopy



Feldspar

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-31-1.1-060507

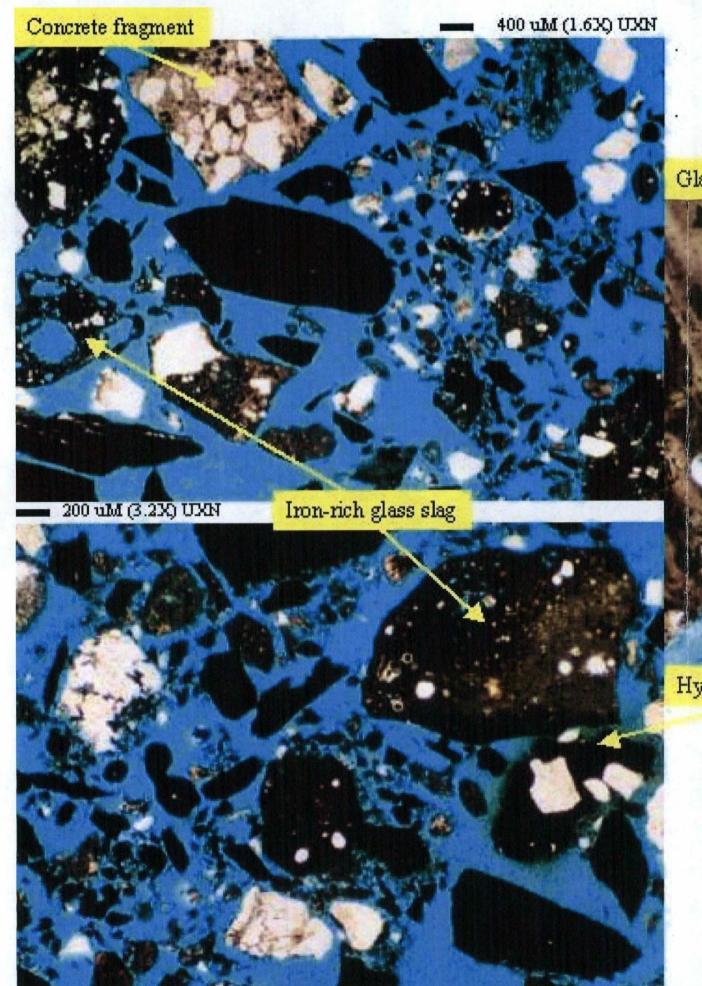
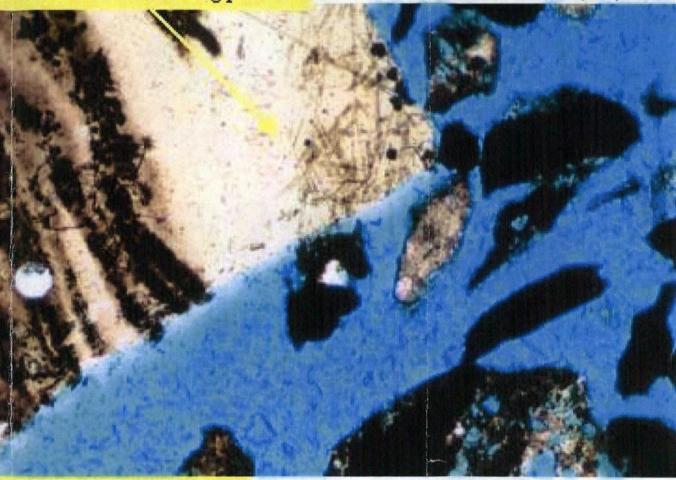


Figure XVIII Thin Section Photomicroscopy

Glass + mullite-rich slag particle

125 uM (10X) UXN



Hydrocarbon stain (green)

CH2M Hill

Location: Edgewater, NJ Sample ID: SB-29-6.7-060507

Figure D-1: Black Slag-Rich Soil and Reddish Purple Soil Data Comparisons Arsenic Concentrations in Soil

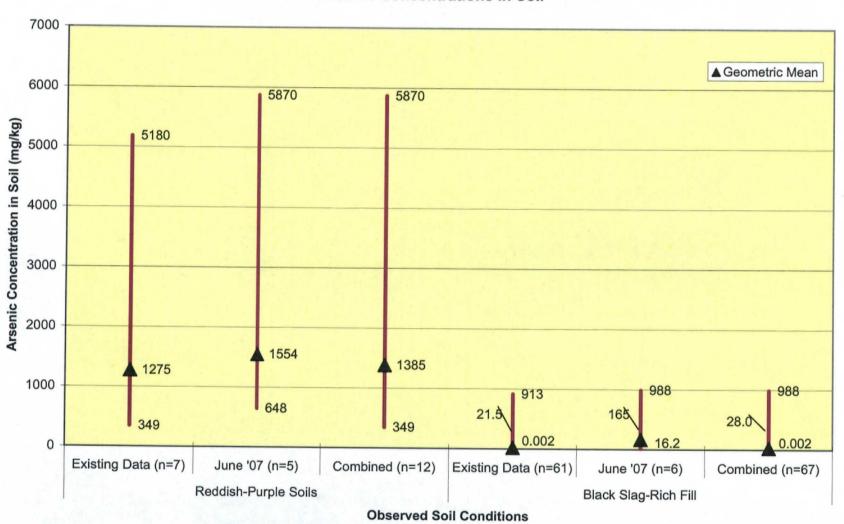


Figure D-2: Black Slag-Rich Soil and Reddish Purple Soil Data Comparisons
Antimony Concentrations in Soil

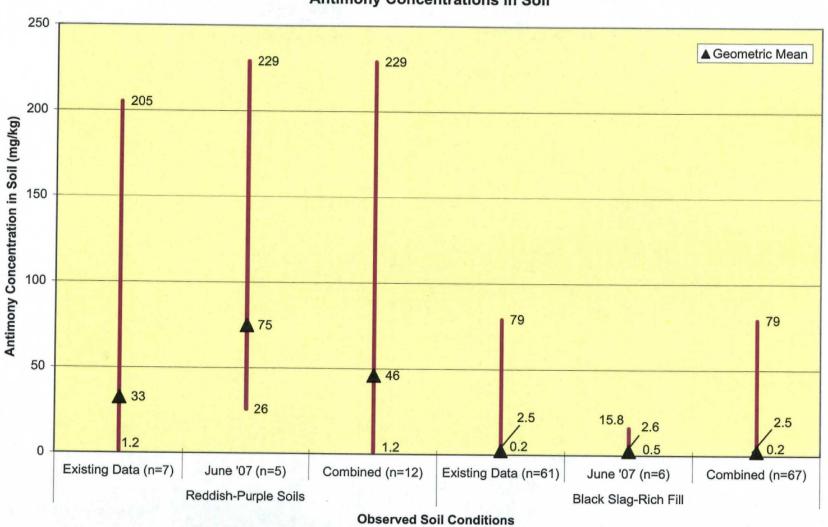


Figure D-3: Black Slag-Rich Soil and Reddish Purple Soil Data Comparisons Copper Concentrations in Soil

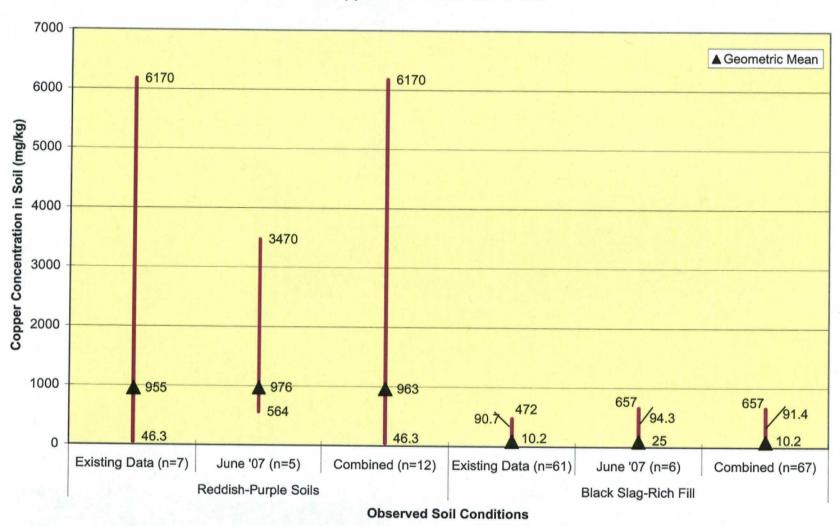


Figure D-4: Black Slag-Rich Soil and Reddish Purple Soil Data Comparisons Lead Concentrations in Soil

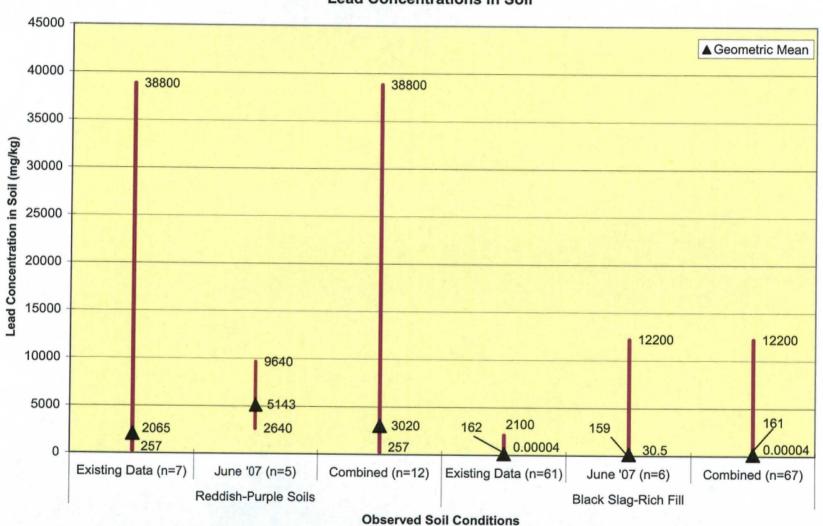
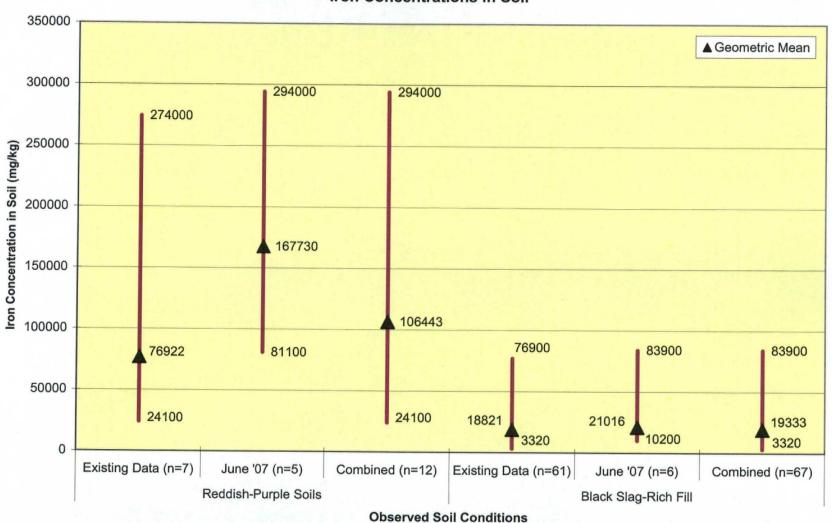


Figure D-5: Black Slag-Rich Soil and Reddish Purple Soil Data Comparisons Iron Concentrations in Soil



DRAFT Summary of the OU1 Supplemental Investigation Metals Soil Sampling and Evaluation of Cinder/Ash and Pyrite-Impacted Soils, Quanta Resources Site, Edgewater, NJ

PREPARED FOR:

Richard Ho, USEPA Region 2

PREPARED BY:

CH2M HILL

COPIES:

Bob Hayton, NJDEP Tim Metcalf, Honeywell Rich Kampf, ESAG

DATE:

February, 9, 2007

Introduction

As part of the OU1 Supplemental Investigation (SI), soil sampling was performed at several locations at the Quanta Resources Superfund Site Operable Unit 1 (OU1) (the Site) * where further analytical characterization of arsenic as well as other metals was deemed necessary to further assess the nature and extent of various potential sources of these constituents. The SI scope of work was developed to fill data gaps identified in the Draft OU1 Remedial Investigation (RI) presented in the Draft Preliminary Site Characterization Report (PSCR; CH2M HILL, 2006a) submitted to the United States Environmental Protection Agency (USEPA) and the New Jersey Department of Protection (NJDEP) on February 22, 2006, and from subsequent discussions with the USEPA and NJDEP. In addition to the SI scope, analytical data for soils sampled by others at adjacent properties were obtained and included in the Site database to assist in the evaluation of spatial trends of the constituents detected above regulatory screening criteria at OU1. Details of the SI soil sampling results for metals in Site soils and the adjacent properties are summarized and discussed in this memorandum.

The Site RI is being conducted pursuant to the requirements of the USEPA Administrative Order on Consent (AOC) II-CERCLA-2003-2012 for the Uplands Area, Operable Unit (OU) 1, entered into by Honeywell International, Inc. (Honeywell), and the Edgewater Site Administrative Group (ESAG Group) on November 4, 2003. The Site was listed on the National Priorities List on September 9, 2002.

The scope of the SI is presented in the Remedial Investigation/Feasibility Study Work Plan Addendum Operable Unit 1 (CH2M HILL, 2006b) submitted to the USEPA and the NJDEP

^{*}As defined in the Administrative Order on Consent (AOC) II-CERCLA-2003-2012, the Site includes the former Quanta Resources property, located on River Road in Edgewater, New Jersey, and any areas where contamination from the property has come to be located.

on July 28, 2006. The two data gaps identified from the Draft PSCR that resulted in soil samples being collected and analyzed for arsenic and other metals during the OU1 SI were:

- The extent of select metals exceeding New Jersey Residential Direct Contact Soil Cleanup Criteria (RDCSCC) in soil [0-12 ft below ground surface (bgs)] at Block 93, Lots 1, 2, and 3 in the vicinity of borings SB-10, SB-11, and SB-13; and
- The further definition of the nature and extent of impacts at the Quanta Resources property related to the former General Chemical Company Acid Plant[†] to the north along the border with the Edgewater Enterprises property (former Celotex property). Specifically, the work in this area was designed to determine how the impacts relate to the distribution of waste associated with the former sulfuric acid plant operations, and in turn, elevated concentrations of arsenic and other metals in soil that exceed New Jersey RDCSCC.

Specific Scope to Address Metals in Soil Data Gaps

The RI/FS Work Plan Addendum (Section 6.2.2, Metals Sampling and Analysis) proposed the following scope to address the metal data gaps, as follows:

- Soil sampling will be performed at Block 93, Lots 1, 2, and 3 to further characterize select metals (iron, antimony, beryllium, and thallium) that were detected above residential soil criteria in this area during earlier RI/FS soil sampling. At a total of nine locations [three proposed TarGOST™ locations and six additional conventional boring locations (SB-19 through SB-24)], two soil samples will be collected from each boring. Metals soil sampling locations are illustrated on Figure 6-1. One sample will be collected from the 0-to 2-foot bgs interval. The second sample will be collected from the soil interval between 2 and 10 feet bgs that appears most contaminated, based on soil screening results and or visual and olfactory observations. Samples will be analyzed for USEPA SW-846 TAL metals. QA/QC samples will be collected at the frequency specified in the revised OAPP) (CH2M HILL, 2005).
- In addition, soil borings will be completed and samples will be collected for the analysis of TAL metals within the northwest portion of the Quanta Resources property and the southern portion of the K. Hovnanian, LLC property (former Celotex property). This sampling will assess the extent of impacts from the former General Chemical acid plant that had operations in these areas. A significant dataset exists (shown in the arsenic contour maps in Appendix B) for this area, and the additional data collected as part of this supplemental RI/FS task is intended to supplement those data and provide greater resolution as to the extent of these impacts.
- At a total of five proposed TarGOSTTM locations [four at the Quanta Resources property (TL16-06, TL16-07, TL16-09, TL17-08) and one at the K. Hovnanian, LLC property (TL17-05)], two soil samples will be collected from each boring. Sampling locations are illustrated on Figure 6-1. One sample will be collected from between 0 and 2 feet bgs. The second sample will be collected from the soil interval between 2 feet and the top of

[†] The General Chemical Company Acid Plant is not subject to investigation/remediation in the USEPA Administrative Order on Consent (AOC) II-CERCLA-2003-2012 for the Uplands Area, Operable Unit (OU) 1. As requested by USEPA and NJDEP the SI included additional characterization of arsenic in soils at the Site with respect to potential sources of arsenic to soils and groundwater in the portion of the Site that within the former General Chemical Company footprint.

the silty-clay aquitard that appears most contaminated based on soil screening results and/or visual and olfactory observations. Specifically, if purplish-red soil/cinders are encountered in either the 0- to 2-foot bgs interval or the greater-than 2-foot interval, samples of that material will be collected and analyzed for TAL metals, VOCs, SVOCs, and PCBs using USEPA SW-846 and SPLP (USEPA Method 1312).

The OU1 SI also addressed other data gaps identified from the Draft PSCR and as discussed with USEPA and NJDEP, for which samples were collected that are not discussed in this memorandum. Additionally, the samples that are included in this memorandum were analyzed for several other constituents to address one or more of the other OU1 SI data gaps. Arsenic and other metals results for samples collected during the SI in order to address the two data gaps listed above will be the focus of this document. However, the results of all analyses performed on these samples are summarized in the data tables included herein in order to evaluate the other non-metal relationships in the various cinders identified across the area. Further presentation and discussion of these sample results, as well as the results of other samples that were collected as part of the OU1 SI, will be included in the Draft OU1 Remedial Investigation (RI) Report.

Background Information

Sulfuric Acid Plant

Based on a review of pertinent historical site information performed as part of the RI, it appears that a portion of the sulfuric acid plant (operated by General Chemical Company from approximately 1900 until the mid-1950s) was located on the part of the current Quanta Resources property that was subsequently used in the 1970s and 1980s as part of Quanta Resources oil recycling operations (Figure 1). The bulk of these acid plant operations were located to the north of this area on the Edgewater Enterprises property, which was recently developed for mixed residential and commercial use. During this redevelopment, "arsenic hotspots" detected during drilling, test pitting and soil sampling activities were either removed or covered with an impermeable liner.

Areas on the 1911 Sanborn® Fire Insurance map that are labeled "pyrites," "ore crusher," and "acid chambers" appear to extend onto the northern portions of the current Quanta Resources property (summarized in Figure 1). The presence of "acid chambers" suggest that this plant used the chamber process for making sulfuric acid in contrast to the contact process. However, a more detailed inspection of the Sanborn® map from 1900 (around the time of the original construction of the plant) reveals that there was a structure present called the "platina stills" (Platina meaning platinum). The presence of platina, or platinum stills, means that this plant used the contact process, not the chamber process, to produce high-quality solutions of sulfuric acid (98%) opposed to the lower grade 50 to 60% acid solutions made using the chamber process. This is consistent with the fact that General Chemical controlled the rights at this time to one of the two most extensively used contact processes in the United States known as the "Badische process" (DeWolf, 1921). Contact plants involved very different processes that required the generation of a consistent grade of particulate-free sulfur stream in the production of high-grade sulfuric acid.

Pyrite Ore Roasting

The General Chemical sulfuric acid production process would have involved the burning of elemental sulfur or roasting of lump or fine grained pyrite ore. Pyrite areas illustrated on the available Sanborn® maps indicate areas where this plant roasted pyrite in order to create the sulfur necessary for the production of sulfuric acid. It is not clear whether this plant roasted fine pyrite ores or lump ore; however, the type of burners used for each method were distinctly different and fines burners were the most common for larger operations such as this, as they had a large capacity with small ground area, significantly reduced the labor involved in roasting, and produced a more consistent product, the last of these reasons being why a contact plants such as this one would have very likely used fines in their ore roasting process. Reigel's *Handbook of Industrial Geochemistry* states, "General Chemical erected a pyrite-burning contact plant using the Herreshoff furnace in 1900" (Kent, 1974). This statement likely refers to this plant, as the date is consistent with when this plant was constructed. The Herreshoff furnace, a picture of which is included herein as Figure 2, was designed to burn fine pyrite ore (DeWolf, 1921).

The major byproduct of the pyrite roasting process would have been the "calcine" or cinders/ashes that were made up of iron oxide minerals left in the bottom of the roasters after the ore was reduced and all the sulfur was burned off. The roaster was fed from the top and would mechanically turn the ore and as it was roasted, the ore was continually reduced and the remaining cinders would end up at the bottom where there would be an outlet from which they could be retrieved. During roasting, pyrite is oxidized to iron oxide minerals, which gives the resulting calcine their characteristic red color (DeWolf, 1921).

In addition to the calcine another less abundant byproduct of pyrite roasting operations would have been burner gas dust. When fine grained or powdered pyrite ore was roasted the resulting gases would contain dust that would need to be removed from the process stream as it would contaminate the resulting acid and reduce efficiency of the process by affecting various components. This was the case for both the chamber and contact processes, but especially important during production of high-grade acids at contact plants such as this plant. In order to remove the dust from the burner gases a mechanical device was used to slow or reversing the burner gases and knock out the roasting dust. Washing of the gases was another method that was considered inefficient due to the dramatic effect the water had on reducing the burner gases; hence, it is unlikely that this would have been done at this plant in any regularity (DeWolf, 1921).

Many acid plants had a market for the cinder material produced as a result of the pyrite process as iron blast furnace material (DeWolf, 1921). Other reported uses for this material included use in the production of pigments, ceramics, and concrete. It is likely, based on the market at the time for this calcine, and the sites proximity to significant transportation networks (i.e., rail systems and Hudson River shipping lanes) that these materials were readily taken off-site for use in other industrial operations. It is unclear whether the roasting dusts would have been including in this material. This material would have been very fine grained powder like material that may have eventually been mixed with the calcine.

Pyrite Cinder-Impacts

Byproducts of the pyrite ore roasting process (both calcine and roaster dust) would have been a reddish in color (due to it's reduction to iron oxide minerals) and would likely have

high concentrations of arsenic, iron, and perhaps other metals such as lead, copper, antimony, and thallium depending on the origin of the ore material. In the southern portion of the Edgewater Enterprises property and northwestern corner of the Quanta Resources property distinct horizons of reddish-purple silt and clay with sand or gravel have been observed. These discolored soils have been sampled and found to contain concentrations of arsenic upwards of thousands of mg/kg with concentrations as high as 35,000 mg/kg[‡] in one sample collected by Dan Raviv Associates in 2002 (Dan Raviv Associates, 2002). Levels of lead and iron were also elevated in these samples. The extent of these materials has been laterally defined on the attached Figure 3 using soil descriptions from boring logs at the Quanta property as well data from the Edgewater Enterprises property including available boring logs and cross-sections developed by TRC Raviv and presented in the Groundwater Remedial Investigation Report for the Former Celotex Industrial Park (TRC Raviv, 2004). In this report as well as in the Final Soil RI Report (Dan Raviv Associates, 2002) this area is referred to as the "High Concentration Arsenic Area" and the reddish-purple deposits are characterized as fine to coarse grained sand and are distinguished as the "lower fill."

Observations of the reddish-purple soils and consistently elevated concentrations of various metals correlate well with the former footprint of the General Chemical Acid Plant indicating that they are likely related to the operations that once took place at that plant. These reddish-purple layers do not contain visible slag or cinder, and because they do not appear beyond the footprint of the former operations they are not likely to be remnants of waste piles, but are instead likely residues that built-up in and around the burners, calcine handling areas, and dust knock out collection areas during the 50 years of operation. The "upper fill" that is referred to on the Edgewater Enterprises property is a dark brown fine to coarse –grained sand and silt with wood, brick, and cement fragments. These materials were likely placed here upon the demolition of the plant, which according to historical aerial photographs occurred between 1953 and 1961.

There is no evidence of calcine waste from the cinder roasting operations outside the footprint of portions of the former manufacturing facility, suggesting that waste cinders were transported off-site as raw materials to be used in other industrial operations, most likely sintered and used as iron blast furnace material.

Historic Fill Deposits

Beyond the area where reddish-purple impacts have been observed, and across all the properties in the area, fill deposits containing black cinder and ash have been consistently documented in boring and test pit logs. These ash/cinder-containing fill deposits are generally thicker, less distinct, and contain a heterogeneous mix of dark brown and black sand, silt, and gravel with wood and coal cinders and ash, as well as bricks and glass. These materials do not exhibit the same characteristic colors and textures observed within the footprint of the former General Chemical Acid Plant.

In order to determine those locations where black heterogeneous cinder/ash deposits were identified relative to the reddish-purple discolored soils during investigations performed at five properties in the area (e.g., Edgewater Enterprises, Block 93, 115 River Road, Former

[‡] CH2M HILL did not validate the data from this investigation and does not make any representations as to the accuracy of this value.

Unilever (Lever Brothers), and Quanta Resources properties) 390 available soil boring logs were reviewed for any mention of ash, cinder, or reddish-purple discoloration. Table 1 provides a summary of information for all the locations where cinder/ash and reddish-purple intervals were observed.

In total, there were 110 locations across these five properties where cinders and/or ash or reddish-purple discoloration were documented to exist within the soils. The summary included as part of Table 1 breaks down these observations by property. Of those 110 locations, 14 had descriptions of reddish-purple horizons, none of which mention the presence of cinders and/or ash. These 14 locations were located exclusively in the southern portion of the Edgewater Enterprises property and the northwestern corner of the Quanta Resources property. At the former Unilever (Lever Bros.) property, 31 locations were documented to contain cinders/and or ash. These deposits were typically described as black and at over 30 percent of these locations the presence of coal within these deposits was also documented. A map showing all the locations where cinders and/or ash were documented to exist is included on the attached Figure 3.

These anthropogenic deposits are likely a result of systematic infilling aimed at raising the topographic elevation of the tidal wetlands that dominated this area along the banks of the Hudson River until the mid 1800s. The contrast in how this area was mapped in 1832 versus 1863 indicates that the majority of filling had occurred in the interval of time between these maps. Figure 4 shows each of these maps overlain on the current USGS 7.5 minute quadrangle and highlights the approximate location of the former Quanta Resources property. Coal was commonly used as a domestic heat source and for the generation of industrial power between 1840 and 1920 and was also the source of fuel for trains during this time (LSP Assoc., 1999). The spent ashes and cinders associated with this widespread use of coal would have dominated as a material for filling during this time.

Furthermore, this type of historic fill has been well documented to contain elevated levels of arsenic that are above applicable residential soil standards. For example, the NJDEP's Historic Fill Database, as summarized in Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005), indicates that arsenic has been detected in historic fill deposits in New Jersey at concentrations up to 1,098 mg/kg. As would be expected, the presence of these ubiquitous fill deposits across all the properties adjacent to the Quanta Resources property has resulted in the detection of several areas, both on- and off-site, where concentrations of arsenic, and to a lesser extent other metals and pyrogenic polynuclear aromatic hydrocarbons (PAHs), are elevated. Also, it should be noted that the background median concentration and 90th Percentile concentrations for arsenic in native soils in New Jersey for "Urban Coastal Plain Soils" for which the Site is located, is 5.2 mg/kg and 13.6 mg/kg, respectively (Sanders, May 2003).

Objectives of the Supplemental Investigation

The scope of the OU1 SI was designed to further delineate arsenic and lead at the Quanta Resources property and to characterize the composition and leachability of encountered purple-red soil related to the former General Chemical Company Acid Plant. In addition, the SI was designed to further evaluate areas of historic fill at Block 93 and within the extent of OU1 where concentrations of select metals, including arsenic, are above USEPA Region 9 Preliminary Remediation Goals (PRGs) and/or New Jersey RDCSCC, whichever is lower.

These impacts are not related to coal tar or oil recycling and it is not reasonable to believe, based on what is known about the former site uses, historical mapping, and field descriptions of the sampled media, that they are the result of anything other than historic filling. As is the case with all other properties along the banks of the Hudson River in this area these fill materials, unlike the reddish-purple soils discussed above, are ubiquitous in nature and cannot reasonably be tied to a specific historical operation. Because of these soil's consistency with the types of material that were historically used throughout this area of New Jersey, in accordance with Section 4.6(b)2iii of the New Jersey Technical Requirements for Site Remediation, they were not evaluated beyond the extents of the Site.

Field Sampling Activities

Field sampling activities implemented during the OU1 SI soil sampling event were conducted pursuant to the Remedial Investigation/Feasibility Study Work Plan Addendum Operable Unit 1 (CH2M HILL, 2006b).

The scope of the arsenic characterization activities was as follows::

- Soil sampling was conducted at Block 93, Lots 1, 2, and 3 at a total of nine locations to
 further characterize select metals (iron, antimony, beryllium, and thallium) that were
 detected above residential soil criteria in this area during earlier RI/FS soil sampling.
- Soil samples were collected for USEPA SW-846 Target Analyte List (TAL) metals
 analysis at five locations within the northwest portion of the Quanta Resources property
 and at one location on the southern portion of the K. Hovnanian, LLC property (former
 Celotex property). This sampling was conducted to assess the extent of impacts from
 the former General Chemical Acid Plant that had operations in these areas. Specifically,
 when purplish-red soil/cinders were encountered, samples of that material were
 collected and analyzed.

Moreover, there were several minor additions, as discussed below, to the OU1 SI Work Plan that were implemented in response to discoveries that were made as field work was being conducted. These changes included the collection of additional samples and additional analyses being added to existing samples. The changes that are applicable to this memorandum (i.e., which resulted in additional samples being analyzed for metals) are discussed below.

Following the completion and submittal of the OU1 Addendum Work Plan and prior to the commencement of field work, the need to enhance the future human health risk assessment data sets for the Site was identified. In response sampling for chromium speciation was added at five locations at the Quanta Resources property (TL14-09, TL16-07, TL17-06, TL17-07, and TL17-08), one location at the Edgewater Enterprises property (TL18.5-1.5), one location at the former Unilever (Lever Brothers) property (TL11-07.5) and three locations on the Block 93 property (SB-22, SB-24, and SB-26). At these locations, the samples were collected and analyzed for total and hexavalent chromium to provide the trivalent chromium concentration. At the other two locations on the Edgewater Enterprises and former Unilever (Lever Brothers) properties (TL18.5-1.5 and TL11-07.5) total chromium and hexavalent chromium analyses were added and the same process was followed to

determine the trivalent chromium results. The results of this activity will be reported separately.

As part of the SI for supplemental soil characterization for metals, a total of thirty (30) soil borings were completed for the OU1 SI. Samples were collected from 18 of these 30 soil borings for metals analysis. These locations are shown on Figure 5. Table 2 provides a summary of the locations where additional soil samples were collected to address arsenic and other metals related data gaps during the SI and indicates what each sample was analyzed for.

Soil Sampling

Off-site boring locations were surveyed and scanned for utilities prior to drilling using a combination of ground penetrating radar, electromagnetic conductance, and magnetics. In addition to the private utility survey/markout, New Jersey One Call was contacted to mark out utilities for the area. On-site boring locations were also surveyed; utilities were previously located in this area. Additionally, all appropriate permits and forms were completed as required by the NJDEP.

All soil samples were collected using a Geoprobe® with disposable acetate macrocore liners. Sampling equipment was decontaminated prior to, and after each use. Prior to collecting samples, the entire soil column was scanned with a calibrated Photoionization Detector (PID) equipped with a 10.6eV lamp for volatile organic compounds (VOCs). Other observations such as obvious odor, appearance, and presence of nonaqueous phase liquid (NAPL) were also recorded during soil sampling. Soil boring logs were completed for each boring and are provided in Appendix A.

All samples were placed in clean bottles provided by the laboratory. Samples were transported by courier to Accutest Laboratories under standard chain-of-custody protocol.

For quality control, duplicate (Dup) and Matrix Spike/Matrix Spike Duplicates (MS/MSD) samples were collected at a rate of 1 per 20 samples per the USEPA-approved Quality Assurance Project Plan (QAPP). Trip blanks (TB) accompanied VOC sample collection vials and were included in the coolers that contained VOC samples, while equipment rinsate blanks (EB) were collected after decontaminating the sampling equipment.

Metals-Impacted Soils at Block 93

At eight soil boring locations at Block 93 Lots 1, 2, and 3 (SB-19 through SB-24, TL14-10.75, and TL15-10.75), two soil samples were collected from each boring. One sample was collected from the unsaturated soil interval that appeared most impacted based on soil screening results and/or visual observations. The second sample was collected from the saturated soil interval above the silty-clay aquitard that appeared most impacted based on soil screening results and/or visual observations. Each sample was analyzed for TAL metals using USEPA Methods 6010B/7471.

Sulfuric Acid Plant Area

At a total of five boring locations, four at the Quanta Resources property (TL16-06, TL16-07, TL16-09, and TL17-08) and one at the Edgewater Enterprises property (TL17-05), two soil samples were collected from each boring. One sample was collected from between 0 and 2

ft bgs. The second sample was collected from the soil interval between 2 feet and the top of the silty-clay aquitard that appeared most impacted based on PID soil screening results and/or visual observations. Specifically, if purplish-red soil/cinders were encountered in either interval, samples of that material were collected.

Soil samples from the 5 locations were analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, PCBs by USEPA Method 8082, and TAL metals by USEPA Methods 6010B/7471. The samples also underwent Synthetic Precipitation Leachate Procedure (SPLP) using USEPA Method 1312. The leachate resulting from this procedure was then analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, PCBs by USEPA Method 8082, and TAL metals by USEPA Method 6010B. Samples from two of the five locations were also analyzed for hexavalent chromium by USEPA Method 196.

Additional OU1 SI Metals Soil Sampling

Three additional locations (TL4-09, SB-26, and TL14-09) that were not included in the OU1 SI Work Plan, two at the Block 93 property (TL12-10.75 and SB-26) and one at the Quanta Resources property (TL14-09), were analyzed for TAL metals (Figure 5).

At locations TL14-09 and SB-26, soil sampling was separately planned in order to fill data gaps and/or serve as a confirmatory data point for the Tar-specific Green Optical Screening Tool (TarGOSTTM) work that was also being performed as part of the OU1 SI. TAL Metals were added to the analyte list for the soil samples collected at these locations to provide additional resolution within these areas. At location TL12-10.75, soil sampling not originally planned in the OU1 SI Work Plan was performed in order to quantify positive TarGOSTTM responses in areas where coal tar impacts were not previously thought to exist. TAL Metals were again added to the analyte list in order to take advantage of the opportunity to better characterize the extent of metals impacts observed in the vicinity of Block 93.

At location TL14-09, a sample was collected from the soil interval below the water table and above the top of the silty-clay aquitard from the soil that appeared most impacted based on PID soil screening results and/or visual observations. This sample was analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, PCBs by USEPA Method 8082, and TAL metals by USEPA Method 6010B.

At location SB-26, two distinct depth intervals were sampled; the first sample was collected above the water table and the second sample was collected from the soil interval below the water table and above the top of the silty-clay aquitard. At both depth intervals the sample was collected from the soil that appeared most impacted based on PID soil screening results and/or visual observations. These samples were analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, TAL metals by USEPA Method 6010B, hexavalent chromium by USEPA Method 7196, and pH by USEPA Method 9045.

At location TL12-10.75, soil samples were collected from two distinct depth intervals; the first sample was collected from above the water table. The second sample was collected from the soil interval below the water table and above the top of the silty-clay aquitard. At both intervals the sample was collected from the soil that appeared most impacted based on PID soil screening results and/or visual observations. These samples were analyzed for

VOCs by USEPA method 8260B, SVOCs by USEPA Method 8270C, PCBs by USEPA Method 8082, and TAL metals by USEPA Method 6010B.

Two additional boring locations (TL17-06 and TL17-07) on the Quanta Resources property were added to those which were described in the OU1 SI Work Plan as part of the sulfuric acid plant waste investigation. At each of these locations one sample was collected from the soil interval between 0 feet and the top of the silty-clay aquitard that appeared most impacted based on photoionization detector (PID) soil screening results and/or visual observations (i.e., the presence of reddish-purple soils). These samples were analyzed for TAL metals by USEPA Methods 6010B/7471, hexavalent chromium by USEPA Method 7196, and pH by USEPA Method 9045.

Pyrite Cinder-Impacted Soil Field Observations

Reddish-purple material suspected to be impacts associated with pyrite cinders was observed in soil at four of the seven boring locations that were drilled in and around the suspected sulfuric acid plant impact area. Specifically, a distinct interval of reddish-purple to dusky red gravelly silt and clay, typically about 2 feet in thickness, was found just below the water table between approximately 1.25 to 5 ft bgs in the northwest corner of the Quanta Resources property at locations TL16-09, TL17-06, and TL17-08. At the fourth location (TL17-07) fine sand with a purplish hue was observed between 10 and 11 ft bgs. Samples of each of these materials were collected for laboratory analysis and are discussed below. Field observations of the pyrite cinder-impacts were described in the boring logs which are provided in Appendix A.

Results Discussion

The laboratory results for the samples collected to investigate the metals-impacted soils at Block 93 are presented in Table 3a. The laboratory results for the samples collected in order to investigate the pyrite cinder-impacts are presented in Table 3b. Those samples that were collected from intervals exhibiting potential pyrite cinder impact (TL16-09-2.0, TL17-08-4.0, TL17-06-4.0 and TL17-07-11) are flagged as such in Table 3b. The results of the analyses performed on the leachate from the 10 samples collected as part of the pyrite cinder-impacts investigation after undergoing SPLP testing are provided in Table 4.

Metals-Impacted Soils at Block 93 and Outside the Pyrite Cinder-Impacted Area

Results for the 20 samples collected from Block 93 and outside the pyrite cinder-impacted area at the Quanta Resources property showed exceedances of the lowest of the industrial and residential USEPA Region 9 Preliminary Remediation Goals (PRGs) and NJDEP Soil Cleanup Criteria for iron, lead, arsenic, and thallium. The minimum, maximum, and geometric mean concentrations of metals for these 20 samples relative to Region 9 PRGs and NJDEP Soil Cleanup criteria are presented in Table 5.

Total arsenic results ranged from non-detect to 220 mg/kg in the soil samples collected from the ten boring locations in the vicinity of Block 93, Lots 1, 2, and 3, and the one additional location on the Quanta Resources property (TL14-09). Arsenic levels were higher at shallower depths in all nine locations where two depth intervals were sampled. Total arsenic results from the 20 samples analyzed exceeded the USEPA Region 9 residential and

industrial clean up criteria of 0.39 and 1.6 mg/kg, respectively. Nine of the 20 samples exceeded the NJDEP residential and non-residential direct contact Soil Cleanup Criteria of 20 mg/kg.

Total lead results for soils ranged from 5.5 to 1,960 mg/kg. Total lead levels were higher at shallower depths in 8 of the 9 boring locations where two depth intervals were sampled. Four of the 20 samples exceeded the NJDEP residential Soil Cleanup Criteria of 400 mg/kg and the USEPA Region 9 residential Soil Cleanup Criteria of 400 mg/kg. Those same four samples exceeded the NJDEP non-residential direct Soil Cleanup Criteria of 600 mg/kg. One sample exceeded the USEPA Region 9 industrial Soil Cleanup Criteria of 800 mg/kg.

Total iron results for soils ranged from 3,320 to 76,900 mg/kg. Four of the 20 samples exceeded the USEPA Region 9 residential Soil Cleanup Criteria of 24,000 mg/kg. None of the samples exceeded the USEPA Region 9 industrial Soil Cleanup Criteria of 100,000 mg/kg. The NJDEP has not developed soil clean-up criteria for iron.

Pyrite Cinder-Impacted Area Analytical Results

A total of 12 samples were collected from seven locations as part of the pyrite cinder evaluation. This group of samples represent those collected from the northwest portion of the Quanta Resources property where the presence of pyrite cinder-impacts and elevated concentrations of metals in soil have been documented, and where historical maps indicate the former General Chemical Acid Plant once existed. Of these 12 samples, 4 were documented to have been collected directly from discrete intervals of reddish-purple or dusky red discolored soils. Results from the majority of samples collected in this area indicated consistently elevated levels of a number of metals including antimony, arsenic, copper, iron, lead, selenium, thallium, zinc, and mercury. The 4 samples where pyrite cinder-impacts were observed did not have results of VOCs, SVOCs, or PCBs that differentiated them from the other 28 soil samples collected during the SI.

Total arsenic results from the soil samples collected from the 7 boring locations in and around the pyrite cinder-impacted area ranged from 67.4 to 5,180 mg/kg. Arsenic results from the 12 samples analyzed exceeded the USEPA Region 9 residential and industrial soil clean up criteria of 0.39 and 1.6 mg/km respectively and the NJDEP residential and non-residential direct contact Soil Cleanup Criteria of 20 mg/kg.

Total lead results ranged from 7.3 to 38,800 mg/kg. Eight of the 12 samples exceeded the NJDEP residential direct Soil Cleanup Criteria of 400 mg/kg and the USEPA Region 9 residential PRG of 400 mg/kg. Seven of the 12 samples exceeded the NJDEP non-residential Direct Soil Cleanup Criteria of 600 mg/kg. Six of the 12 samples exceeded the USEPA Region 9 Industrial PRG of 800 mg/kg.

The total iron results ranged from 10,500 to 257,000 mg/kg. Eight of the 12 samples exceeded the USEPA Region 9 Residential PRG of 24,000 mg/kg. Two of the 12 samples exceeded the USEPA Region 9 Industrial PRG of 100,000 mg/kg. The SPLP samples were not analyzed for iron.

SPLP results indicated detectable concentrations of one or more of the following constituents in the leachate of all 10 samples on which this analysis was performed:

- arsenic
- barium
- cadmium
- lead
- selenium
- mercury
- benzene
- chloroform
- 2-methylphenol

Arsenic and lead were the two constituents with the highest measured concentrations in the SPLP leachate. Concentrations of arsenic and lead in SPLP leachate samples were as high as 1.7 mg/L and 11.5 mg/L, respectively. The two highest SPLP leachate results for lead were both from pyrite cinder-impacted soils (i.e., reddish-purple discoloration).

Elevated arsenic levels correlate with the higher lead and iron levels in the pyrite cinder-impacted soils. The three highest total arsenic, total lead, and total iron results occurred in the sample locations where reddish-purple discoloration was observed. In particular, Soil sample TL16-09-2.0 had a total arsenic result of 1,940 mg/kg, a total lead result of 7,730 mg/kg, and a total iron result of 257,000 mg/kg. Soil sample TL17-08-4.0 had a total arsenic result of 1,730 mg/kg, a total lead result of 38,800 mg/kg, and a total iron result of 134,000 mg/kg. Soil sample TL17-06-4.0 had a total arsenic result of 922 mg/kg, a total lead result of 2,840 mg/kg, and a total iron result of 73,600 mg/kg. Soil sample TL17-07-11 had a total arsenic result of 5,180 mg/kg, a total lead result of 471 mg/kg, and a total iron result of 24,100 mg/kg.

The geometric mean concentration of arsenic, copper, lead, and zinc for the 12 samples collected across the pyrite cinder-impacted area were at least one order of magnitude greater than the geometric means for the other 20 samples that were collected outside the pyrite cinder-impacted area as part of SI. Additionally, the geometric mean concentrations of these metals, in addition to antimony, iron, and thallium, for the four samples that specifically targeted reddish-purple soils were all above the lowest of the industrial and residential USEPA Region 9 PRGs, and NJDEP's RDCSCC.

The minimum, maximum, and geometric mean concentrations of metals for these 12 samples are presented relative to USEPA Region 9 PRGs and NJDEP RDCSCC in Table 5. In addition, Table 5 shows the minimum, maximum and geometric mean concentrations of metals for those four samples with visual evidence of cinder impacts.

Comparison of Black Cinder/Ash Impacts to Pyrite Cinder Impacts in Soil

As previously noted, the visual appearance of cinder and/or ash containing fill outside the area of the former sulfuric acid plant is distinctly different than the pyrite-impacted soils within the footprint of the former plant in the following ways:

- It is more heterogeneous;
- It contains actual cinders and slag;
- It is often found in the presence of coal;

- It contains completely different chemical composition with an order of magnitude lower concentrations of arsenic, and,
- It is not the reddish-purple color that is the distinguishing trait of pyrite cinders and pyrite cinder-impacted materials.

In order to evaluate whether there is a qualitative difference between these two materials with respect to their chemical composition, a review was performed of the available analytical data for those locations where boring logs have mentioned the presence of ash, cinders, or reddish-purple soils as indicated in Table 1. Specifically, laboratory soil analytical data for metals analyses was compiled for all 5 properties. Including the latest results from the SI investigation described herein, a total of 68 samples of these materials were evaluated. The results of these analyses are summarized in the attached Table 6.

Pyrite Cinder-Impacted Soils. Of the 68 total samples, seven were of distinctly reddish-purple impacted intervals within the footprint of the former sulfuric acid plant. These 7 samples included 4 from the Quanta Resources property (these samples were collected as part of the SI and are discussed in more detail above) and 3 samples from the Edgewater Enterprises property. It is believed, based on limited figures depicting arsenic data for soil on the Edgewater Enterprises property as well as the Quanta Resources property prior to redevelopment that numerous additional samples of the reddish-purple soils were likely collected as part of the arsenic hot spot removal and the Soil RI Report (Dan Raviv Associates, 2002) at this property between 1999 and 2002. These samples were collected in order to delineate the extent of 1,000 mg/kg of arsenic in soils prior to redevelopment of the Edgewater Enterprises property and hence they represent some of highest concentrations of arsenic collected to date. Because only maps depicting these data were available and boring and test pit logs could not be reviewed, these data could not be correlated with specific soil descriptions and thus could not be included in the data set that represents the pyrite cinder-impacted soils for the purpose of this exercise.

Cinder/Ash Historic Fill. The remaining 61 soil samples represent all documented observations of cinder and/or ash containing fill intervals without any indication of reddish-purple discoloration (i.e., pyrite cinder impacts) that were sampled for arsenic at a minimum. These two data sets are compared in the attached Table 7. Comparison of the geometric mean concentrations of metals between the two data sets indicates that antimony, arsenic, copper, lead, and thallium concentrations are consistently an order of magnitude higher in the pyrite cinder-impacted samples. Maximum concentrations detected in the pyrite cinder-impacted soils are at least one order of magnitude higher than the maximum concentrations detected in cinder/ash samples for antimony, arsenic, copper, iron, lead, selenium, silver, and thallium.

These results indicate that the pyrite cinder-impacted soils have distinctly elevated concentrations of the metals mentioned above, that distinguish them from the other ash/cinder containing fill deposits across the 5 properties. It should also be noted that the geometric mean and range of concentrations in ash/cinder containing fill are consistent with the minimum, maximum and average concentrations published in the NJDEP Historic Fill Database [Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005)]. Conversely, the maximum and geometric mean concentrations of arsenic in pyrite cinder-impacted soil samples are 5,180

mg/kg and 1,275 mg/kg, respectively, and are well above the maximum and average concentrations reported in the NJDEP Historic Fill Database for this constituent. This is also the case for lead where the maximum and geometric mean concentrations in pyrite cinder-impacted soil samples are 38,800 mg/kg and 2,065 mg/kg, respectively, and the maximum and average concentrations in the NJDEP Historic Fill Database are 10,700 mg/kg and 574 mg/kg, respectively.

Statistic Evaluation of the Pyrite Cinder-Impacted Soils vs. Cinder-Ash Fill

A detailed statistical evaluation of the differences between concentrations of metals detected in pyrite cinder-impacted soil (i.e., reddish-purple discolorations) and those detected in cinder/ash containing fill was conducted for the five properties. Specifically, the differences in mean concentrations between the two groups were evaluated statistically using means tests (parametric or non-parametric). The decision to use a parametric or non-parametric test was made by checking for normality using a Shapiro-Wilks test and homogeneity of variance (F-value). If both datasets were normal and had homogeneous variances, then a parametric test (simple t-test) was performed. Otherwise, a non-parametric Mann-Whitney U test was performed. Data were log transformed to achieve normality, if possible. Results of these statistical evaluations are presented in the attached Table 8.

Results from this evaluation indicate that there is a distinct statistical difference between the pyrite-cinder impacted material and all other cinder/ash fill deposits with respect to certain metals.

Extent of Arsenic in Soil at the Site

The arsenic soil data collected as part of the OU1 SI has been used to update soil contours previously developed as part of the RI/FS Work Plan Addendum (CH2M HILL, 2006b). Available soil data and the updated contours are presented for unsaturated (0-4 ft. bgs) and saturated soil (4 ft. bgs and deeper) in Figures 6 and 7, respectively. As illustrated in Figures 6 and 7, the extent of elevated arsenic concentrations in soil related to the former sulfuric acid plant have been defined at the Quanta Resources property as a result of the work performed during the OU1 SI. In addition, these impacted materials were visually identified, sampled and characterized for leachability in order to support the selection of potential remedial options for these impacts.

Additional data gaps identified in the PSCR (CH2M HILL, 2006a) were also addressed as part of the OU1 SI. Specifically, levels of arsenic 100 mg/kg and greater as well as other select metals at Block 93, Lots 1,2, and 3 were addressed through additional sampling. Descriptions of observed materials in this area, as well as the results of analyses performed on these samples indicate that the elevated concentrations of arsenic and other metals are likely due to the presence of Historic Fill. The extent of these impacts have not yet been defined within the boundary of OU1 in accordance with Section 4.6(b)2iii of the New Jersey Technical Requirements for Site Remediation due to the expansion of OU1 in this area as a result of recent detections of coal tar likely related to former operations at the Quanta Resources site. As such, this area remains a data gap that will be addressed as part of a Supplemental RI for OU1.

The presence of these ubiquitous fill deposits across all the properties adjacent to the Quanta Resources property has resulted in the detection of several areas, both on- and off-site, where concentrations of arsenic are at or above applicable soil cleanup criteria. The descriptions of these materials as well as the results of laboratory analytical data indicate that these materials are Historic Fill as defined by the New Jersey Technical Requirements for Site Remediation and thus in accordance with Section 4.6(b)2iii of the New Jersey Technical Requirements for Site Remediation do not require examination beyond the extents of Site. In all areas, with the exception of the aforementioned data gap at Block 93, the extent of arsenic concentrations 100 mg/kg or greater in Historic Fill has been defined.

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TABLE 1 Cinder/Ash Observations and Sampling Summary Quanta Resources Superfund Site Edgewater, New Jersey

	T	1		Observed C		-41																					
		15		Observed C	inder/Ash i	ntervai						<u> </u>	1	1	-т-	Soil	Sam	pling	Anal	ytical	I Sumi	mary	1	$\overline{}$	_	-	·
	,	Canaditant	Total Basins	Cindon/Ash Tan	Coal/ Cinder	74:			Purple-	Sampled	(via 8270)				0	ء و	- 5	22	0 5	2	15	SW6010 SW7470	SW8082	SW8260	5W827U D1498	D422	D4318
Location	Property	Consultant Reference	Total Boring Depth (ft.)	Cinder/Ash Top (ft. bgs)	Bottom (ft. bgs)	Thickness (ft.)	Field Log Description	Cinder/ Ash Sampled	Reddish Color	Interval (ft. bgs)	PAHs	6020	E160.3	E350.2	3W6010	SW7196	V808	V808	SW8260	SW8270	SW9045	SPLP,	SPLP,	م ا	ž Įž	ASTM	STM
MW-103A	Quanta Resources	1	14	0.16	1.4	1.2	gravel w/ cinder, v. dark gray	Cumpicu	00.01	(IL bgs)	α.	6 6	<u>iii</u>	i iii	5 5	5 0	5 5	5	5 5	1 2	5	55 55	122	50 0	<u> </u>	14	ğ
MW-103DS	Quanta Resources	1	54	4.7	6.0	1.3	sandy silt w/ cinder/slag, black, soft, obvious product odor	X		5.0-6.0			1									\top	T			+-1	
MW-104R	Quanta Resources	1	13	0.0	0.5	0.5	black slag/cinder material				-	+-	X	\vdash	<u> </u>	X	- X	X	$\times \mid \times$	+	\vdash	-	+	+		+	
MW-105A	Quanta Resources	. 1	18	3,5	6.0	2.5	gravel with crushed brick and black cinder/slag w/in sub-	X		3.4-3.6			X		X ;			X.	XX	亡					\pm		
MW-112B	Quanta Resources	. 1	17	4.0	4.2	0.2	angular gravel intermixed gravel and cinder/slag, v. dark gray	X		3.6-3.9		\perp	X		X ;	X .	<u> </u>	X	× ×	4	$\perp \perp$	_	_	_	4	-	
	Quanta Resources	1	15	0.0	7.0	7.0	organic silt w/ brick, cobbles, and cinder/slag/fill; various	X		0.0-0.16		+	+			+	+:	+	+	-	++	-	+-	+	+	+-	_
				-			colors organic silt w/ brick, cobbles, and cinder/slag/fill; various	^		0.0-0.16			X		x ;	×	-	X	XX	\Box	1	4	1				
MW-116B	Quanta Resources	1	15	0.0	7.0	7.0	colors	Х	,	1.75-2.0			x		x >	x L		×	x x								
	Quanta Resources	1	15	0.0	7.0	7.0	organic silt w/ brick, cobbles, and cinder/slag/fill; various colors	x		4.5-5.0			x		x >	X ·		x	x x	T							
MW-116DS	Quanta Resources	1	29	2.5	3.0	0.5	gravel intermixed w/ fine sand and cinder/slag/fill; black										-								_	\Box	
MW-117A	Quanta Resources	1	17	0.0	10.0	10.0	fine/med silty sand w/cinder/slag, various colors, obvious naphthalene odor														T						
MW-117B	Quanta Resources	1	18	0.0	14.0	14.0	fine/med silty sand w/ cinder/slag, naphthalene odor, sheen	х		0.0-0.16			×		x >	x	†	x	x x	+					+	\parallel	
IMIVV-117B	Quanta Resources	1	18	0.0	14.0	14.0	fine/med silty sand w/ cinder/slag, naphthalene odor, sheen	х		4.0-5.5			X		x >				x x								
MW-118A	Quanta Resources	1	15	3,0	13.0	10.0	gravel and fine/med sand w/ cinder/slag; black, obvious product odor																				
SB-02	Quanta Resources	1	¸30	0.0	10.0	10.0	med/coarse sand w/ crushed brick, wood, cinder/slag/fill, some soft tar; various colors	Х		0.0-0.16			x		x >	× L	ļ.	x	x x						-		
	Quanta Resources	1	30	0.0	10.0	10.0	med/coarse sand w/ crushed brick, wood, cinder/slag/fill, some soft tar; various colors	Х		9.5-10.0			x		\times	x .		Χ.	x x								
· SB-03	Quanta Resources	1	22	1.0	5.0	4.0	gravel w/ cinder/slag, tar/fill; black, dry, soft and plastic; strong odor	. x		0.0-0.16			x		x >	×		х	хх								
	Quanta Resources	1	22	1.0	5.0	4.0 .	gravel w/ cinder/slag, tar/fill; black, dry, soft and plastic; strong odor	X		3.5-4.0			x		x >	χ.		х	x x	:		_				x	
SB-05	Quanta Resources	1	24	3.75	5.0	1.3	silty sand w/ angular gravel, cinder/slag/fill; black staining, various colors, obvious naph odor																				
SB-06	Quanta Resources	1	24	1,2	2.0	8.0	brick, viscous tar, cinder/slag fill; naph. Odor	X	-	1.5-2.0			X		XX	<u> </u>		X	<u> </u>	4	$\vdash \vdash$	4				X	\Box
TL14-09	Quanta Resources	1	25	3.2	15.0	11.8	cinder/slag intermixed w/in fill, solid coal tar at 9', 12' bgs	X		4.0-6.0					x >	x x			$x \mid x$		x				X		
TL16-07	Quanta Resources Quanta Resources	1 1	25 . 30	3.2 0.0	15.0 5,0	11.8 5.0	cinder/slag intermixed w/in fill, solid coal tar at 9', 12' bgs cinder/slag intermixed w/in fill	X	.	10.0-12.0 0.0-2.0			+		x x	/ -	-		X X X X				-	V	$\mathcal{I}_{\overline{\nu}}$	\Box	\exists
TL16-09	Quanta Resources	1	25	1.25	3.75	2.5	reddish-purple gravelly silt	X	Χ.	1.0-3.0		+			î l	` x	_		ŝlŝ	+-'	X ;	$\frac{2}{x}$	 	$\frac{2}{x}$] ^	+	\dashv
TL17-06	Quanta Resources Quanta Resources	1 1	25 25	0.0 2.0	2.0	2.0 0.5	gravel, cinders, black and dark brown	X	- V	2050		\bot			, .				工	T			\Box			\Box	コ
TL17-07	Quanta Resources	1	20	10.0	11.0	1.0	dusky red gravelly clay med-coarse sand w/ purplish hue	X	X	3.0-5.0 10.0-12.0		+	+		X X X X	₹ X			+	+-	X	+-			X		\dashv
TL17-08	Quanta Resources	1	25	0.0	5.0	5.0	intermixed cinders w/in fill, dusky red fill	Х	X	3.0-5.0		T			XX	₹ X		X	X X		XX	x x	X	x x	X		\exists
B-3	Quanta Resources Quanta Resources	4	25	6.0	7.0	5,0 1,0	intermixed cinders w/in fill, dusky red fill wood and coal tar	X		0.0-2.0		+	+	\vdash	<u> </u>	\ 	-	X	<u> </u>	+-!	X >	X. X	X	$X \mid X$	X	 	\dashv
MW-101	Quanta Resources	4	20	2.0	′2.0	trace	black cinders					\perp			\dashv	-			+	+	\vdash	+	-	+	+	+-+	\dashv
MW-103	Quanta Resources Quanta Resources	4	22 20	3.0	4.0	1.0	cinders, brick, coal tar	X		3.0-4.0	<u> </u>		П		X	T			X		口						
MW-105 MW-106	Quanta Resources Quanta Resources	4	20	9.0	12.0 18.0	12.0 9.0	black cinders dark gray silt w/ cinders, slight marsh odor	X		5.0-5.0 9.0-10.0	X	-	+ +		X	+-			X	+	\vdash	+	-	-	+-	H	_[
MW-109	Quanta Resources	4	22	0.0	18.0	18.0	fill w/ sand, cobbles, gravel, cinders, brown	X		7.0-7.5	X	士			x _		1		î 	+-	\vdash	+-	++	+	+-	-	\dashv
MW-110	Quanta Resources	4	25	9.0	13.0	4.0	cinders, sand, gravel	Х		12.0-13.0	X	T			X .	T			X								
MW-114B MW-119A	115 River Road, LLC 115 River Road, LLC	1 1	29 14	1.0 4.0	7.0 14.0	6.0 10.0	black sandy silt w/ brick, cinder/slag/fill gravelly sand w/ crushed brick, cinder/slag	X		1.5-2.0 14.5-15.0	$\vdash \vdash$	+-	X		X X X X				X X X X		 -	+		+	+		4
MW-119B	115 River Road, LLC	1	16	4.0	16.0	12.0	gravelly sand w/ crushed brick, cinder/slag; various colors	X		9.5-10.0		+	x		$\frac{2}{x}$		1		^ ^ X X		\Box	+	$ \cdot $	+	+	\parallel	\dashv
SB-01	115 River Road, LLC	1	20	1.0	4.0	3.0	gravelly silty sand w/ wood, cinder/slag; very dark brown	Х	-	1.0-1.5			X		ΧХ	<	12	Х	XX			_			\top		\dashv
SB-04	115 River Road, LLC 115 River Road, LLC	1 1	30 30	1.0	3.5 3.5	2.5 2.5	silty to coarse sand w/ cinder/slag; black	X		1.0-1.5	$-\Gamma$	-	X		XX		1	X	XX		二	1			\Box		
MW-101DS	Block 93	1	48	0.3	1.3	1.0	silty to coarse sand w/ cinder/slag; black fine sand w/ cinder/slag, black, dry to moist, obvious pet. product odor	X		3.0-3.5			X	$\vdash \uparrow$	X X	+	-	^	ХХ	+	+	-	H		+	X	-
MW-111A	Block 93	1	30	5.5	6.0	0.5	med-coarse sand w/ crushed brick, cinder/slag/fill					+	1-1			_	+		+	+	+		+	\vdash	+-		\dashv

TABLE 1 Cinder/Ash Observations and Sampling Summary Quanta Resources Superfund Site Edgewater, New Jersey

		T	1	Observed C	inder/Ash	Interval			Γ		Ι					2 110	ampl	na A	n ale de	2 1 0	umma					
		'					;				$\vdash \neg$				—;	5011 5	ampi	ing A	nalyti	cais	umma	ry		ТП		\top
			T.4.15		Coal/ Cinder				Purple-	Sampled	via 8270)				9	1	-	0	,	2	45 SW6010	SW7470	SW8082 SW8260	SW8270	D1498	7422
Location	Property	Consultant Reference	Total Boring Depth (ft.)	Cinder/Ash Top (ft. bgs)	Bottom (ft. bgs)	Thickness (ft.)	Field Log Description	Cinder/ Ash Sampled	Reddish Color	Interval (ft. bgs)	AHs	3074	E160.3	E350.2	SW6010 SW7196	SW7471	SW8081	SW8082 SW8260	W8270	SW9012	SPLP,	SPLP,	SPLP,	PLP,	MTS	
MW-111B	Block 93	1	12	5.5	6.0	0.5	black silty sand w/ cobbles, cinder/slag and cloth/cardboard- like material, obvious odor								0) (0)	0)		<i>y</i> 69	S	0) (0	<i>n</i> <i>o</i> ₀	0)	<i>w</i> <i>w</i>	8	4 4	
SB-10	Block 93	1	26	0.8	6.0	5.2	sub-angular gravel w/ brick, cinder/slag, black, product stain and odor	Х		3.0-4.0			Х	_	x x	X		x x		\dashv	+					+
	Block 93	1	24	0.0	9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	Х	_	0.0-0.16			X			×		x x								+
SB-11	Block 93	1	24	0.0	9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	X		1.5-2.0			X			X		^ ^ x x			+		+			
	Block 93	1	24	0.0	9.5	9.5	sub-angular gravel fill w/ brick, cinder/slag and some fine sand; black, product stain and odor	×		4.5-5.0			X		x x			x x		Ŷ	-				+	+
	Block 93	1	12	1.0	6.0	5.0	coarse sand w/ cinder/slag/fill; black layered cardboard-like mat., tar-like product and petro. odor	×		0.0-1.0			١,	X		X		x x		Ŷ X						+
SB-13	Block 93	1	12	1.0	6.0	5.0	. coarse sand w/ cinder/slag/fill; black, layered cardboard-like mat., tar-like product and petro. odor	×		1.0-2.0				x				x x		Ŷ						1
SB-19	Block 93	1	20	, 0.0	8.0	8.0	intermixed sandy gravel, crushed brick and black cinder/slag	×		1.0-3.0					x A	x		X	\dagger		\top		-	$\dagger \dagger$		+
36-19	Block 93	1	20	0.0	8.0	8.0	intermixed sandy gravel, crushed brick and black cinder/slag	×		4.0-6.0					x	X		X	1 1		1				1	\dagger
SB-20	Block 93	1	30	0.0	6.0	6.0	intermixed black cinder/slag w/in fill (throughout)	Χ		5.0-7.0					X	X		1	1	\neg	_		\dashv	+		+
SB-21	Block 93	1	25	0.5	8.0	7.5	intermixed cinder/slag (w/in fill); obvious odor in bottom 3'	X		1.0-3.0					X	Х		X	X							\top
	Block 93	 	25	0.5	8.0	7.5	intermixed cinder/slag (w/in fill); obvious odor in bottom 3'	Х		5.0-7.0	<u> </u>		-	_	X _	X		X	X							\perp
SB-22	Block 93	1	25	1.5	18.5	17.0	intermixed black cinder/slag w/in fill, viscous black product, solid tar	X .		1.0-3.0					x x	x									x	
	Block 93	1	25	1.5	18.5	17.0	intermixed black cinder/slag w/in fill, viscous black product, solid tar	Х		15.0-17.0					x x	x									x	
SB-23	Block 93	1	20	0,0	9.0	9.0	intermixed silt and gravel, dk brown cinder/slag w/in fill (throughout)	Х		0.0-2.0								x								
SB-23	Block 93	1	20	0.0	9.0	9.0	intermixed silt and gravel, dk brown cinder/slag w/in fill (throughout)	. X _.		2.0-4.0					x	x		x x	х							T
SB-24	Block 93	1 1	25	0.5	6.0	5.5	intermixed silt, cinders and crushed gravel	X		0.0-2.0					X X	X		X	Х		X				X	
SB-25	Block 93 Block 93	1 1	35 35	0.0	10.0	10.0	trace black cinders w/in fill	X		0.0-2.0						1			X							
SB-27	Block 93	+	30	0.0 8.25	10.0 10.0	10.0	trace black cinders w/in fill	X		7.0-9.0			-	_	\perp		_	X	X			\perp		-		
TL12-10.75	Block 93	1	30	0.0	16,25	16.25	black staining and some cinder/slag w/in fill cinders w/in fill; noticable product odor, black broduct and	X ·		9.0-10.0				+		\dagger			-	\dashv		\dashv	-	\Box	+	+
	Block 93	1 1	25	1.0	20.0	19.0	incandescent sheen cinder/slag intermixed w/in fill	X		1.0-3.0	-				x —	X		$\frac{x}{x}$	 ↓ 							+
TL14-10.75	Block 93	1	25	1.0	20.0	19.0	cinder/slag intermixed w/in fill	X		14.0-16.0	-	+	+		X			$\frac{1}{x}$						+		+
TL12.5-11.75	Block 93	1	25	0.0	10.0	10	cinder/slag intermixed w/in fill			14.0-10.0		+	+		`	X	-	4	^							+
TL12.5-12.25	Block 93	1	30	0.7	4.3	3.55	cinder/slag intermixed w/in fill					+-	+	-	+	\vdash	-	+						\vdash		+
TL12-11.75	Block 93	1	25	0.0	16.25	16.25	intermixed cinders w/in fill					-	+		-	1 1	_	-		\dashv	-	-	-	+	-	+
TL14-11.25	Block 93	1 1	30	5.5	6.8	1.3	black, brittle coal tar											1		_				1 1		+
TL15-10.75	Block 93	1 1	50	4.25	7.5	3.3	crushed cinder/slag w/in fill; sheen and product odor																			工
TL17-05 TL18.5-01.5	Edgewater Edgewater	1 1	30 25	3.5	5.0	1.5	some crushed cinder/slag w/in fill						1			1-1	_		1_1							\perp
TL19-0.5	Edgewater	 	30	17.5 27.5	20.0 27.5	2.5 0.0	traces dark gray fibrous wood trace wood w/in fractured rock; obvious odor			00.0.00.5			1-1		-	+		1	-					$\perp \perp$		
SS-18B	Edgewater	- 2	22.5	13.0	14.0	1.0	little slag w/in fill	X		28.0 - 29.5 14.5 - 15.0	-	+	-			+		K X	X					+	_	4
SS-19.5B	Edgewater	- 2	18	11.0	11.0	trace	3-4" grey ash.	^		14.5-15.0	\vdash	+-	11					-			-		-		\dashv	+
SS-20C	Edgewater	2	16	14.0	14.5	0.5	black sandy silt w/ wood	·				-	1 1		-	1-1		+	1		-	-		+		-
SS-22B	Edgewater	-2	20	13.5	14.8	1.3	purple lenses, trace wood	X	X	14.0-14.5	X	+	1			1-1	-	-	1-1		-	-+		+-	-	-
SS-23A	Edgewater	` 2	21.5	12.0	17.0	5.0	black slag w/in sandy fill; throughout interval	X			X		1 1			1 1	÷	+-		-+-	+			+		+
SB-V12	Edgewater	• 3	17	4.0	7.0	3.0	purple-red silt	X	X	6.0-6.5		x x				X.	X .	₹ X	X			\neg		\vdash	\neg	+
SB-W10	Edgewater	3	22	7.0	8.0	1.0	purple fine sand		Χ								.						_	T		\top
SB-W11	Edgewater	3	24	8.0	9.0	1.0	purple-red and black clay	. X	X	8.0-8.5	`	X X				X.	X .	< X	X							\top
SB-W12	Edgewater	3	.20	6.0	10.5	4.5	purple-red silt, clay	X	Х	9.5-10.0	`	X X		`		X	Χ.	< X	X						\top	T
SB-W21	Edgewater	. 3	15	6.0	13.0	7.0	wood fragments, coal pieces in fill	X		9,0-9,5		XX				X.	Χ.	(X	X							I
MW-A-1	Edgewater	7	28	12.5	14.0	1.5	purplish-red fine sand		X)				$oldsymbol{\perp}$	_		\perp			$oxed{oxed}$		\Box	\Box				ŀ
MW-A-2	Edgewater Edgewater	7	22	12.5	14.0	1.5	purplish-red fine sand		X			_ _	-	-		1	·		\sqcup						\Box	
AAAA D	rouewater	1 /	12	9.0	10.0	1.0	black fill w/ cinders					- 1	1 1	- 1		1		- 1	1 1	i)			1		- "
MW-D		7	17	16.0	16 5	0.5	Ellially oil oil de										\div	_								_
MW-D MW-F MW-I	Edgewater Edgewater	7 7	17 19.5	16.0 12.0	16.5 13.0	0.5 1.0	fill/silt w/ cinders, gravel blk/brown fill w/ cinder, ash					I.	-	4	—		1	1				1				

TABLE 1

Cinder/Ash Observations and Sampling Summary Quanta Resources Superfund Site

Edgewater, New Jersey

1		1	1																							
1		÷-		Observed C	inder/Ash	Interval		1		٠.	L.,			, ,		Soil	Sam	pling	Anal	ytical	Sum	mary				
Location	Property	Consultant Reference	Depth (ft.)	Cinder/Ash Top (ft. bgs)	Coal/ Cinder Bottom (ft. bgs)	Thickness (ft.)	Field Log Description	Cinder/ Ash Sampled	Purple- Reddish Color	Sampled Interval (ft. bgs)	PAHs (via 8270)	6020	9014 E160.3	E350.2	SW6010	SW7471	SW8081	SW8082	SW8260	SW8270	SW9045	SPLP, SW6010 SPLP, SW7470	SPLP, SW8082	SPLP, SW8260 SPLP, SW8270	ASTM D1498	ASTM D422
MW-K	Edgewater	7	20 ·	10.0	10.5	. 0.5	gray fill w/ black cinders					1			32	, 0,	<u> </u>	9	0, 10.	/ 10/	1	0, 0,	1 0	" "	1	-
MV-M	Edgewater	7	26	6.0	14.0	8.0	traces coal and slag	X		9.2-9.7			_	\vdash	x	+	+	1-1	-	-		+	+		+-+	
MW-N-1	Edgewater	7	26	7.5	8.5	1.0	red-purple sand w/ silt, coal		Х																\Box	\top
MW-N-2	Edgewater	7	16	7.5	8.5	1.0	red-purple sand w/ silt, coal		X						\dashv	_	+-		+	-	1-1	-	++	-	+-	+
MW-N-3	Edgewater	7	. 60	7.5	8.5	1.0	red-purple sand w/ silt, coal		Х							+-	1		\top			_	+	1		, — †
MW-O	Edgewater	7	20	1.5	4.0	2.5	fill w/ sand, gravel and cinders; brown	1					+		-	+-	1	1-1	-	+		-	++	-	+	
GZA-32	Former Lever Bros.	5	17	4.0	10.0	6.0	little wood w/in fill (not burnt)	X		2,0-4.0			1	\vdash	X	_	 	X	XX	X	+-+	\neg	++	-	+-+	
GZA-35	Former Lever Bros.	5	5	0.0	5.0	5.0	little coal w/in fill	X		3.5-4.0					_	_	1	X		_	1	_	1		+	
GZA-36	Former Lever Bros.	5	4	0.0	4.0	4.0	trace coal w/in fill	X		3.5-4.0						\top	1	X			T				+	\neg
GZA-38	Former Lever Bros.	5	5	4.0	5.0	1.0	white flakes of ash and coal w/in black sand/gravel	X		3.5-4.0							1	X								\Box
GZA-42	Former Lever Bros.	5	10	1.5	4.8	3.3	little coal and cinders w/in sandy fill													1.						
GZA-43	Former Lever Bros.	5	20	0.75	9.00	8.3	cinders w/in sand/gravel fill	Χ.		4.0-4.5					X				$X \rangle$	<u> </u>						
GZA-45	Former Lever Bros.	5	15	0.0	10.0	10.0	little cinders, coal, ash and timbers w/in black sandy fill	Х		2.0-3.0					х		L	x	X >	x						
GZA-46	Former Lever Bros.	5	15	0.0	5.0	5.0	little cinders and black coal seams w/in fill (throughout interval)	X		4.0-5.0					x				X		T		\prod			
GZA-47	Former Lever Bros.	5	15	0.0	3.0	3.0	little coal and ash w/in fill						_	1	-	+		1	$\stackrel{\sim}{+}$	+	1		+	+	+	\rightarrow
GZA-48	Former Lever Bros.	5	15	7.5	15.0	7.5	little cinders w/in black sandy fill; mothball-like odor; wet	X		9.0-10.0			-		х	1	+		x	-	-	_	+		+-+	-
GZA-49	Former Lever Bros.	5	10	6.0	10.0	4.0	little cinder and ash w/in black sand; oil stains	X		5.0-6.0		-			X	\top	1		X	+		_	+	+	1.	\top
B-7	Former Lever Bros.	6	12	7.0	7.0	trace	black wood at ~7.0					_	-		-							1		_	+	
LB-11	Former Lever Bros.	6	20	9.5	11.0	1.5	dark grey to black cinders									\top	Τ.		\top			_			+	
LB-18	Former Lever Bros.	6	16	4.0	8.0	4.0	intermittent cinders w/ gravel, sand; black	X		3.5-4.0					X				XX							
LB-21	Former Lever Bros.	:6	10	2.5	3,5	1.0	trace cinders	X		2.5-3.0					X		X.	X	XX	<i>x</i>		$\neg \vdash$				
LB-24	Former Lever Bros.	6	13	2.5	12.5	10.0	black fill w/ cinders	Х		4.0-4.5					x		X	Х	X >	X.						
LB-25	Former Lever Bros.	, 6	12	0.0	4.5	4.5	trace cinders	X		4.5-5.0					х		X	X	x 2	χ						
LB-26	Former Lever Bros.	, 6		4.0	12.0	8.0	cinders w/in black fill and sand	X		4.0-4.5					x	+-			X >			_	+	-	+	_
LB-27	Former Lever Bros.	-6	13	5.0	12.0	7.0	cinders found w/in black fill and sand								\neg		1		-	+	\vdash	_	+++		+-+	
LB-4	Former Lever Bros.	. 6	16	3.5	4.0	0.5	moist brick and cinders	X		3.5-4.0					X		X	X	X >	X		-		\top	+	\top
LB-8	Former Lever Bros.	6	20	8.5	16.0	7.5	dark brown to black cinders, 2" cinder layer at 12'										1			1			1	_	1	
MW-29	Former Lever Bros.	6	8	5.0	6.0	1.0	black fill w/ cinders, sand	X	`	4.5-5.0					X		X	X	X >	X						
MW-31	Former Lever Bros.	6	12	8.0	8.0	trace	black "cola-like" material								\Box	\perp	1									
MW-6	Former Lever Bros.	6	5	5.0	5.0	trace	trace black cinders at ~5.0																	I		
MW-7	Former Lever Bros.	6	20	3.0-4.0'	3.0	4.0	black-brown cinders w/ clay, gravel					_					1									
MW-120B MW-122A	Former Lever Bros. Former Lever Bros.	1	19 . 15	3.16 6.25	13.0	9.8	clayey silt w/ cinder/slag; dark brown	X		3.5-4.0	\sqcup		_ X		x >	4	1	X	X >	4			\coprod		oxdot	X
GZ45-MW40	Former Lever Bros.	5	6	2.0	7.0 4.0	0.8 2.0	fine sand w/ crushed brick, cinder/slag/fill				\sqcup						1	\sqcup	\perp	4_	\sqcup	_	1		\perp	
GZ45-MVV40 GZA-1	Former Lever Bros.	5	2	0.5	2.0	1.5	some wood fragments w/in fill trace coal slag fragments							$\vdash \bot$		+	<u> </u>		-		 	\perp	+	\perp	1:1	\rightarrow
GZA-1A	Former Lever Bros.	5	8	0.5	0.5	trace	little coal slag		<u> </u>		┝╌┼					+-	+:~		-	+-	1		+	+	+	
GZA-30	Former Lever Bros.	- 5	20	2.0	10.0	8.0	little coal and cinders w/in fill; petroleum-like odor, sheen	X		7.0-7.5		-+-			x	+-	++	1	XX	/-	\vdash	- -	1-1	-	+	

Summary of Cinder/Ash Observations and Samples

		# of Locations w/Pyrite	# of Samples	# of Samples of Pyrite Cinders/
	# of Locations	Cinder	of Cinder/ Ash	Ash
Property	Observed	Observations	Observations	Observations
115 River Road,				
LLC	5	0	6	0
Block 93	22	0	22	0
Edgewater	25	10	9	4
Former Lever Bros.	31	0	18	0
Quanta Resources	27	4	25	4
Total:	110	14	80	8

Notes:
UNK - Unknown
NA - Not Available
N/A - Not Applicable
Consultant Reference:
1. CH2M HILL

- Environ
- 2. Environ
 3. Environmental Waste Management Associates
 4. GeoSyntec
 5. GZA
 6. Langan Engineering
 7. TRC Raviv Associates, Inc.

TABLE 2

Supplemental Investigation Soil Sampling for Metals Impacts

Quanta Resources Superfund Site Edgewater, New Jersey

Location ID	Property	Target Soils (all depths in ft. bgs)	VOCs by SW- 846 8260B	SVOCs by SW- 846 8270C	PCBs by SW- 846 8082.	TAL Metals by SW-846 6010B/7471	Chrome VI (Hexavalent) by SW7196	SPLP by EPA Method 1312 (see Notes)	pH by SW9045
		Metals-Impacted Soils near B							
SB-19	Block 93	Most impacted above water table (≈4') (based on TarGOST borings to N and S target 1-3' if no obvious impacts)	*	×		x			
, maj s	Lots 1,2,3	Most impacted below water table and above silty clay layer (based on TarGOST borings to N and S target 10-12' if no :	x	x		×			
SB-20	Block 93	Most impacted above water table (≈4')				×			
	Lots 1,2,3	Most impacted below water table and above silty clay layer				x			
SB-21	Block 93 Lots 1,2,3	Most impacted above water table (≈4') Most impacted below water table and above silty clay layer	X X	x		x ·			
SB-22	Block 93	Most impacted above water table (≈4¹). Might be same as above interval, if so collect one sample for all	x	x .	x	x	x		. x
	Lots 1,2,3	Most impacted below water table and above silty clay	×	x		×	x		. x
SB-23	Block 93	Most impacted above water table (≈4')	×	×	×	х			
	Lots 1,2,3	Most impacted below water table and above silty clay	×	x		×			
	Block 93	Most impacted above water table (≈4') (based on TarGOST borings to E and S target 1-3' if no obvious impacts)	×	×		×	×		×
SB-24	Lots 1,2,3	Most impacted below water table and above silty clay layer (based on TarGOST borings to E and S target 10-12' if no obvious impacts)	×	x		×	x		×
TL14-10.75	Block 93	Most impacted unsaturated soil	, ×	×	×	×			
114-10.75	Lots 1,2,3	Most impacted below water table and above silty clay layer	×	x	×	Χ.			
TL15-10.75	Block 93 Lots 1,2,3	Most impacted above water table				×			
	2010 1,2,0	Most impacted below water table and above silty clay layer				×		<u> </u>	
		Pyrite Cinders Impacts							
TL16-06	Quanta	0' - 2', look for purplish-red soil/cinders Most impacted between 2' and top of confining layer -	×	х	х	х		х	
		IMPACTED = purplish-red soil/cinders 0' - 2', look for purplish-red soil/cinders	×	×	×	x ×	x	x x	
TL16-07	Quanta	Most impacted between 2' and top of confining layer - IMPACTED = purplish-red soil/cinders	×	×	×	×	×	×	
TL16-09	Quanta	0' - 2', look for purplish-red soil/cinders Most impacted between 2' and top of confining layer -	×	x	×	x		x	
		IMPACTED = purplish-red soil/cinders 0' - 2', look for purplish-red soil/cinders	X	X .	×	X		Х	
TL17-08	Quanta	Most impacted between 2' and top of confining layer - IMPACTED = purplish-red soil/cinders	×	×	×	×	×	×	,
TL17-05	Edgewater	Most impacted above the water table - look for purplish-red soil/cinders	×	×	×	x		x	
1117-00	Enterprises	Most impacted between the water table and the top of confining layer - look for purplish-red soil/cinders	×	×	· ×	×		×	
		Additional Samples Not Included in	SI Work P	lan					
SB-26	Block 93	Most impacted	х	Х		Х	Х		Х
TL12-10.75	Block 93	Most impacted shallow soil above 10 ft. (GW @ ≈3' bgs - no room for unsat. sample which was original plan)	X	×	х	x			
TL14-09	Quanta	Most impacted below water table and above silty clay layer Most impacted shallow soil (GW @ 2' bgs - no room for	x x	X X	X	×	x		X
TL17-06	Quanta	unsat. sample which was original plan) Most impacted between 0 and top of confining layer -	,		î	· ^	x		x
	Quanta	IMPACTED = purplish-red soil/cinders Most impacted between 0 and top of confining layer -				. x			

Notes: SPLP: Synthetic Precipitation Leachate Procedure (USEPA Method 1312)

TAL metals: Target Analyte List metals

*SPLP will be run and the extract will be analyzed for TAL metals, VOCs, SVOCs and PCBs (this is in addition to the analysis of the soils for these parameters).
*Specific Laboratory Analytical methods and analyte lists are provided in the revised Quality Assurance Project Plan (QAPP) for Operable Unit 1.

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93 Quanta Resources Superfund Site

Edgewater, New Jersey

	Leastion		CD.	-19		ator, rew ocr		2.04	1 05		T	
	Location	- F				-20		3-21		I-22 ·	SB	
-	Field Sar	'	SB-19-1.0	SB-19-5.0	SB-20-19.5	SB-20-6.0	\$B-21-2.0	SB-21-6.0	SB-22-16	SB-22-2.0	SB-23-11	SB-23-3.0
'		Date	10/12/2006	10/12/2006	10/12/2006	10/12/2006	10/13/2006	10/13/2006	10/13/2006	10/13/2006	10/18/2006	10/18/2006
	Start Do	epth (ft)	1	4`	19	5	1	5	. 15	1	10	2
	End De	epth (ft)	3	6	20	7	3	7	17	3	12	4
Parameter -	Method	Units			·			*				
ALUMINUM	SW6010	mg/kg	5560	1150	4530	4420	10200 J	4520	938	6740	2210	7010
ANTIMONY	SW6010	mg/kg	16	2.3ND	2.5ND	- 2.4ND	2.0 J	2.6ND	2.3ND	41	2.6ND	2.9ND
ARSENIC	SW6010	mg/kg	118	4.0	1.4ND	14	18	13	9.4	220	20	27
BARIUM	SW6010	mg/kg	118	21 J	62	53	94	48	15 J	195	150	123
BERYLLIUM	SW6010	mg/kg	0.34ND	0.13ND	0.27ND	0.71	1.9	0.59 J	0.073ND	0.29 J	0.14ND	0.36 J
CADMIUM	SW6010	mg/kg	0.59ND	0.57ND	0.61ND	2.8	0.52ND	0.65ND	0.58ND	0.63ND	0.66ND	0.72ND
CALCIUM	SW6010	mg/kg	19000	1840	547 J	10500	· 10200	4360	1090	40800	/ 2150	6290
CHROMIUM	SW6010	mg/kg	18	5.7	7.0	32	57 J	18	13	84 .	14	36
COBALT	. SW6010	mg/kg	17	2.3 J	3.6 J	11	16	5.5ND	2.0 J	5.6 J	3.7 J	7.4
COPPER	SW6010	mg/kg	138	16	9.3	141	252	45	16	91	29	96
IRON	SW6010	mg/kg	22100	4790	8950	76900	23600	13700	3320	31800	8530	17100
LEAD	SW6010	mg/kg	1960	70 .	5,5	715	286 .	297	56	790	, 36	181
MAGNESIUM .	SW6010	mg/kg	1840	192 J	1910	2350	6750	1280	268 J	2360	782	2280
MANGANESE	SW6010	mg/kg	117	21	105	987	233 J	95	21	361	61	141
NICKEL	SW6010	mg/kg	18	5.7	8.7	32	83 J	14	5.2	23	9.5	17
POTASSIUM	SW6010	mg/kg	535 J	154 J	544 J	345 J	835 J	422 J	128 J	1020	302 J	957
SELENIUM	SW6010	mg/kg	28	1.0 J	2.5ND	1.5 J	1.1 J	1.4 J	1.8 J	2.5ND	2,1ND	3.2ND
SILVER	SW6010	mg/kg	0.67 J	1.1ND	1.2ND	1.2ND	1.0ND	1.3ND	1.2ND	1.3ND	1.3ND	1.4ND
SODIUM	SW6010	mg/kg	512ND	203ND	174ND	113ND	863 J	372ND	236ND	369ND	336ND	599 J
THALLIUM	SW6010	mg/kg	1.2ND	1.1ND	1.2ND	1.2ND	1.0ND	1.3ND	1.2ND	13ND	1.3ND	1.4ND
VANADIUM	SW6010	mg/kg	32	6.7	8.0	56	35	14	3.5 J	26	9.8	
ZINC	SW6010	mg/kg	184	40	22	218	504	227	25	117	41	23 120
MERCURY	SW7471	mg/kg	10	0.22	0.038ND	0.098	0.44 J	0.25	0.13	1.3	'	
CHROMIUM III	SW7196	mg/kg	10	0.22	0.000110	0.030	0.44 J	0.23	13	1.3 84	0.15	0.65
HEXAVALENT CHROMIUM	SW7196	mg/kg	•		. •				1.1ND	1.2ND		
OXIDATION-REDUCTION POTENTIAL	ASTM D1498	mv				`	,		298	386	.1	
pH	SW9045	S.U.							8.5	6.8		
AROCLOR-1016	SW8082	mg/kg	.*		·				6.5	0.040ND		0.040ND
AROCLOR-1221	SW8082	mg/kg										0.048ND
AROCLOR-1232	SW8082			-						0.040ND		0.048ND
AROCLOR-1242	SW8082	mg/kg								0.040ND		0.048ND
AROCLOR-1248	SW8082	mg/kg				*	•	,		0.040ND		0.048ND
AROCLOR-1254	SW8082	mg/kg mg/kg								0.040ND		0.048ND
AROCLOR-1260	SW8082	1								0.040ND		0.048ND
1,1,1-TRICHLOROETHANE	SW8260	mg/kg	0.38ND	· 18ND		*	4.0ND	0.40ND	COND	0.25	07115	0.048ND
1,1,2,2-TETRACHLOROETHANE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
1,1,2-TRICHLOROETHANE	SW8260 SW8260	mg/kg mg/kg	0.38ND 0.38ND	18ND	,		1.2ND	0.49ND	120ND	0.34ND	27ND	6.5ND
1,1,2-TRICHLOROTRIFLUOROETHANE	SW8260	mg/kg	0.38ND	. 18ND	1		1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
1,1-DICHLOROÉTHANE	SW8260	mg/kg	0.38ND	18ND	•		1.2ND	0.49ND 0.49ND	20ND	0.34ND	" 27ND	6.5ND
1.1-DICHLOROETHENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND 0.49ND	20ND	0.34ND 0.34ND	27ND	6.5ND
1,2,4-TRICHLOROBENZENE	SW8260		0.38ND	18ND			1.2ND		20ND		27ND	6.5ND
1,2-DIBROMO-3-CHLOROPROPANE	SW8260	mg/kg	0.38ND 0.75ND				1.2ND	0.49ND	20ND -	0.34ND	27ND	6.5ND
1,2-DIBROMOETHANE	SW8260 SW8260	mg/kg	0.75ND 0.075ND	36ND			2.4ND	0.99ND	41ND	0.67ND	54ND	13ND
1,2-DIBROMOETHANE		mg/kg		3.6ND			0.24ND	0.099ND	4.1ND	0.067ND	5.4ND	1.3ND
1,2-DICHLOROBENZENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
II '	SW8260	mg/kg	0.075ND	3.6ND		·	0.24ND	-0.099ND	4.1ND	0.067ND	5.4ND	1.3ND
1,2-DICHLOROPROPANE 1,3-DICHLOROBENZENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	. 27ND	6.5ND
II ·	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
1,4-DICHLOROBENZENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
2-BUTANONE	SW8260	mg/kg	0.75ND	36ND			2.4ND	0.99ND	41ND	0.67ND	54ND J	13ND J
2-HEXANONE	SW8260	mg/kg	0.38ND	18ND	,		1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
4-METHYL-2-PENTANONE	SW8260	mg/kg	0.38ND	18ND	·		1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
ACETONE	SW8260	mg/kg	0.75ND	36ND	ļ.		2.4ND	0.99ND	41ND	0.67ND	54ND J	13ND J
BENZENE	SW8260	mg/kg	0.075ND	1.9 J			0.13 J	2.0	2.9 J	0.067ND	3.7 J	2.8
BROMODICHLOROMETHANE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
BROMOFORM .	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
BROMOMETHANE :	SW8260 SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
CARBON DISULFIDE .		mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	. 27ND	6.5ND

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93 Quanta Resources Superfund Site

Edgewater, New Jersey

Г	1			24		ater, New Jer		10.75				
· .	Location	- F		-24	TL14			-10.75	SB-26		-10.75	TL14-09
	Field Sa	mple ID	SB-24-1.0	SB-24-11	TL14-10.75-15	TL14-10.75-2.0	TL15-10.75-1.0	TL15-10.75-8.0	SB-26-14	TL12-10.75-14.5	TL12-10.75-7.0	TL14-09-5.0
		Date	10/16/2006	10/16/2006	10/13/2006	10/13/2006	10/16/2006	10/16/2006	10/13/2006	10/16/2006	10/16/2006	10/11/2006
.	Start D	epth (ft)	0	10	14	1	0	8	13	13.5	5.5	4
	End D	epth (ft)	2	12	16	3	2 .	8.5	15 ·	15.5	7.5	6 .
Parameter .	Method	Units		·				-			7.0	Ĭ
ALUMINUM .	SW6010	mg/kg	5050	8560	6050	5330 ·	6400	2390	5700	5070	2110	2810
ANTIMONY	SW6010	mg/kg	3.9 J	2,7ND	3.4ND	7.1	1.9 J	2.4ND	2.6ND	2.5ND	2.5ND	2.9ND
ARSENIC	SW6010	mg/kg	38 J	2.5ND	2.9 J	111	32	4.7.	124	14	30	16
BARIUM	SW6010	mg/kg	73	12 J	. 20 J	124	75	35	45	35	31	43
BERYLLIUM	SW6010	mg/kg	0.20ND	0.42 J	0.23ND	0.27 J	0.37 J	0.26 J	0.18ND	0.42 J	ł	0.38 J
CADMIUM	SW6010	mg/kg	0.72	0.31ND	0.85ND	1.3	1.2	0.48 J	0.65ND	0.42 J 0.28ND	0.22 J 0.22 J	0.38 J 0.73ND
CALCIUM	SW6010	mg/kg	11100	295 J	8540	3580	10400	6470	8670	2300	857	42800
CHROMIUM	SW6010	mg/kg	12	9.8	12	17	16	8.2	14	16	8.1	8.3
COBALT	SW6010	mg/kg	6.7 J	8.9	3.3 J	9.5	9.3	4.7	7.8	6.8		
COPPER	SW6010	mg/kg	262	14	13	178	133	26	30	. 25	4.7 50	5.6 J
IRON	SW6010	mg/kg	25300	13200	9550	25300	20600	15600	15500	1	· .	32
LEAD	SW6010	mg/kg	323 J	5.7	23	731	320	54	15	14200	. 6960	11600
MAGNESIUM	SW6010	mg/kg	6530	3360	2380	2490	4090	1020	2220	26	106	82
MANGANESE	SW6010	mg/kg	221	95	63	101	196	154		2740	513 J	2590
NICKEL	SW6010	mg/kg	19 J	17	7.4	22	25	154	62 19	174	71	79
POTASSIUM	SW6010	mg/kg	· 541 J	798	1230			1		16	15	15
SELENIUM	SW6010	mg/kg	1.5 J	2.7ND	1230 3.4ND	424 J 3.7	868	344 J	356 J	844	403 J	557 J
SILVER	SW6010	mg/kg	0.75 J	1.3ND	3.4ND 1.7ND		1.1 J	1.1 J	2.6ND	2.2 J	1.7 J	2.1 J
SODIUM	SW6010	mg/kg	282ND	1.3ND 128ND	1.7ND 2930	1.1 402ND	0.66 J	1.2ND	1.3ND	1.3ND	1.3ND	1.5ND
THALLIUM	SW6010						595ND	277ND	634 J	1240 J	233ND	327ND
VANADIUM	SW6010	mg/kg	1.1ND	1.3ND	1:7ND	5.5ND	1.2ND	1.2ND	1.3ND	1.3ND	1.3ND	1.5ND
ZINC		mg/kg	35	12	14	47	32	17	20	18	14	. 55
MERCURY	SW6010	mg/kg	181 J	35	28	561	204	50	22	36	36	65
CHROMIUM III	SW7471	mg/kg	0.58	0.040ND	. 0,52	2.7	0.66	0.18	0.038 J	0.11	0.11	0.70
HEXAVALENT CHROMIUM	SW7196	mg/kg	12	9,8					14			8.3
	SW7196	mg/kg	0.56 J	0.43 J					1.3ND			1.4ND
OXIDATION-REDUCTION POTENTIAL	ASTM D1498	mv	483	382					240	1 1		46
pH·	SW9045	S.U.	7.2	7.4					8.7]		8.3
AROCLOR-1016	SW8082	mg/kg			0.17ND	0.12ND				. 0.13ND	0.041ND	0.55ND
AROCLOR-1221	SW8082	mg/kg			0.17ND	0.12ND				. 0.13ND	0.041ND	0.55ND
AROCLOR-1232	SW8082	mg/kg			0.17ND	0.12ND				0.13ND	0.041ND	0.55ND
AROCLOR 1242	SW8082	mg/kg			0.17ND	0.12ND		•	:	0.13ND	0.041ND .	0.55ND
PIROCEOIX-1240	SW8082	mg/kg			0.17ND	0.12ND	•	1		0.13ND	0.041ND	0.55ND
AROCLOR-1254	SW8082	mg/kg			0.17ND :	1.7				0.13ND	0.041ND	0.55ND
AROCLOR-1260	SW8082	mg/kg			0.17ND	3.6				0.13ND	0.041ND	0.55ND
1,1,1-TRICHLOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,1,2,2-TETRACHLOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	_ 0.46ND	8.4ND
1,1,2-TRICHLOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,1,2-TRICHLOROTRIFLUOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND .	0.46ND	8.4ND
1,1-DICHLOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND		•	0.50ND	25ND	0.46ND	8.4ND
1,1-DICHLOROETHENE		mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,2,4-TRICHLOROBENZENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,2-DIBROMO-3-CHLOROPROPANE	SW8260	mg/kg	0.73ND	0.80ND	46ND	44ND	1		0.99ND	49ND	0.92ND	17ND
1,2-DIBROMOETHANE	SW8260	mg/kg	0.073ND	0.080ND	4.6ND	4.4ND			0.099ND	4.9ND	0.092ND	1.7ND
1,2-DICHLOROBENZENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND .		•	0.50ND	25ND	0.46ND	8.4ND
1,2-DICHLOROETHANE	SW8260	mg/kg	0.073ND	0.080ND	4.6ND	4.4ND	l		0.099ND	4.9ND	0.092ND	1.7ND
1,2-DICHLOROPROPANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,3-DICHLOROBENZENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
1,4-DICHLOROBENZENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
2-BUTANONE	SW8260	mg/kg	0.73ND	0.80ND	46ND	44ND		ļ	0.99ND	49ND	0.92ND	17ND
2-HEXANONE	, SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
-··	SW8260	mg/kg	0.37ND	0.46ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND J
4-METHYL-2-PENTANONE _				0.00010	46ND	44ND			0.99ND	49ND	0.92ND	17ND
1	SW8260	mg/kg	0.73ND	0.80ND	70110							
4-METHYL-2-PENTANONE _		mg/kg mg/kg	0.73ND 0.073ND	3 0.080ND	18			1	0.26	29		
4-METHYL-2-PENTANONE _ ACETONE : '	SW8260			r.	18	14			0.26	29	2.7	24
4-METHYL-2-PENTANONE - ACETONE : BENZENE	SW8260 SW8260	mg/kg mg/kg	0.073ND 0.37ND	0.080ND 0.40ND	18 23ND	14 22ND			0.26 0.50ND	29 25ND	2.7 0.46ND	24 8.4ND
4-METHYL-2-PENTANONE _ ACETONE : BENZENE : BROMODICHLOROMETHANE :	SW8260 SW8260 SW8260	mg/kg	0.073 N D	0.080ND	18	14			0.26	29	2.7	24

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93 Quanta Resources Superfund Site Edgewater, New Jersey

					Lugew	ater, New Jer	sey					
	Locatio	}	SB	-19	SE	3-20	SB	3-21	SB	3-22	SB	-23
	Field S	ample ID	SB-19-1.0	SB-19-5.0	SB-20-19.5	SB-20-6.0	SB-21-2.0	SB-21-6.0	SB-22-16	SB-22-2.0	SB-23-11	SB-23-3.0
		Date	10/12/2006	10/12/2006	10/12/2006	10/12/2006	10/13/2006 :	10/13/2006	10/13/2006	10/13/2006	10/18/2006	10/18/2006
:	Start I	Depth (ft)	1	4 .	19	5	1	5	15	1	10	2
		Depth (ft)	3	6	20	7	3	7	17	3 .	12	٠ 4
Parameter	Method	Units										
CARBON TETRACHLORIDE ; CHLOROBENZENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	: 27ND	6.5ND
CHLORODIBROMOMETHANE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6,5ND
CHLOROETHANE	SW8260 SW8260	mg/kg	0.38ND	18ND		ì	1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
CHLOROFORM	SW8260	mg/kg	0.38ND 0.38ND	18ND 18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
CHLOROMETHANE	SW8260	mg/kg mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
CIS-1,2-DICHLOROETHENE	SW8260	mg/kg	0.38ND	18ND			1.2ND 1.2ND	0.49ND 0.085 J	20ND . 20ND	0.34ND	27ND	6.5ND
CIS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.38ND	18ND	•		1.2ND	0.49ND	20ND 20ND	0.34ND 0.34ND	27ND 27ND	6.5ND 6.5ND
CYCLOHEXANE .	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND 0.34ND	27ND · 27ND	6.5ND
DICHLORODIFLUOROMETHANE	SW8260	mg/kg	0.38ND	18ND		*	1.2ND	0.49ND	20ND	0.34ND	± 27ND	6.5ND
ETHYLBENZENE :	SW8260	mg/kg	0.075ND	30			0.23 J	0.66	8.2	0.067ND	9.6	2.4
ISOPROPYLBENZENE	SW8260	mg/kg	0.38ND	19		1	1.2ND	0.37 J	20ND	0.34ND	27ND	6.5ND
METHYL ACETATE ;	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
METHYL TERT-BUTYL ETHER ;	SW8260	mg/kg	0.075ND	3.6ND			0.24ND	0:099ND	4.1ND	0.067ND	5.4ND	1.3ND
METHYLCYCLOHEXANE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6,5ND
METHYLENE CHLORIDE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
O-XYLENE	SW8260	μg/kg	75ND	23800		1	250	140	4110	67ND	5400ND	1060 J
STYRENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	. 27ND	6.5ND
TETRACHLOROETHENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	· 27ND	6.5ND
TOLUENE	SW8260	mg/kg	0.075ND	3.6ND			0.73	2.2	· 8.2	0.067ND	4.8 J	1.1 J
TRANS-1,2-DICHLOROETHENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.082 J	20ND	0.34ND	27ND	6.5ND
TRANS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
TRICHLOROETHENE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.070 J	20ND	0.34ND	27ND	6,5ND /
TRICHLOROFLUOROMETHANE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	. 27ND	6.5ND
VINYL CHLORIDE	SW8260	mg/kg	0.38ND	18ND			1.2ND	0.49ND	20ND	0.34ND	27ND	6.5ND
XYLENES, M & P XYLENES, TOTAL	SW8260	µg/kg	150ND	35200			643	532	9370	130ND	5920 J	2630
1,1'-BIPHENYL	SW8260 SW8270	mg/kg	0.15ND 4.6 J	59 67			0.89	0.67	14	0.13ND	7.8 J .	3.7
2,4,5-TRICHLOROPHENOL	SW8270	mg/kg mg/kg	1.0ND	9.9ND			41	20 J	260	0.026 J	73 J	44
2.4.6-TRICHLOROPHENOL	SW8270	mg/kg	1.0ND	9.9ND			0.88ND 0.88ND	1.1ND 1.1ND	1.8ND 1.8ND	0.21ND	6.5ND	2.4ND
2,4-DICHLOROPHENOL	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND 0.21ND	6.5ND 6.5ND	2.4ND
2.4-DIMETHYLPHENOL	SW8270	mg/kg	1.0ND	9.9ND			5.6 J	2.4	280 J	0.21ND 0.21ND	14	2.4ND _. 6.5
2,4-DINITROPHENOL	SW8270	mg/kg	4.1ND	40ND			3.5ND	4.2ND	7.4ND	0.82ND	26ND	9.6ND
2,4-DINITROTOLUENE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
2,6-DINITROTOLUENE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
2-CHLORONAPHTHALENE	SW8270	mg/kg	0.41ND	4.0ND		,	0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
2-CHLOROPHENOL	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	. 1.8ND	0.21ND	' 6.5ND	2.4ND
2-METHYLNAPHTHALENE	SW8270	mg/kg	4.7 J	460 J			170	68	1680	0.11ND	408 J	136
2-METHYLPHENOL	SW8270	mg/kg	1.0ND	9.9ND			5.1 J	1.4	123 J	0.21ND	3.0 J	2.1 J
2-NITROANILINE	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
2-NITROPHENOL	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
3&4-METHYLPHENOL	SW8270	µg/kg	1000ND	9900ND			12600 J	4020	292000 J	210ND	8630	6310
3,3'-DICHLOROBENZIDINE	SW8270	mg/kg	1.0ND J	9.9ND			0.88ND J	1.1ND	1.8ND J	0.21ND J	6.5ND	2.4ND J
3-NITROANILINE	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
4,6-DINITRO-2-METHYLPHENOL 4-BROMOPHENYL PHENYL ETHER	SW8270	mg/kg	4.1ND	40ND			3,5ND	4.2ND	7.4ND	0,82ND	26ND	9.6ND
4-CHLORO-3-METHYLPHENOL	SW8270 SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND · -	2.6ND	0.96ND
4-CHLOROANILINE	SW8270 SW8270	mg/kg mg/kg	1.0ND 1.0ND	9,9ND 9,9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
4-CHLOROPHENYL PHENYL ETHER	SW8270	mg/kg mg/kg	0.41ND	9.9ND 4.0ND			0.88ND	1.1ND 0.42ND	1.8ND	0.21ND 0.082ND	6.5ND	2.4ND
4-NITROANILINE	SW8270	mg/kg	1.0ND	9.9ND			0.35ND 0.88ND	0.42ND 1.1ND	0.74ND	0.082ND , 0.21ND	2.6ND 6.5ND	0.96ND
4-NITROPHENOL	SW8270	mg/kg	4.1ND J	40ND J			3.5ND	4.2ND	1.8ND 7.4ND	0.21ND 0.82ND	26ND	2.4ND
ACENAPHTHENE	SW8270	mg/kg	54	501			3.5ND 313	222	7.4ND 1060	0.82ND	26ND 360	9.6ND
ACENAPHTHYLENE	SW8270	mg/kg	3.5 J	15			21 J	17	75 J	0.44	3.5	345 13
ACETOPHENONE	SW8270	mg/kg	1.0ND -	9.9ND	·		0.88ND	1.1ND	1.8ND	0,21ND	6.5ND	2.4ND
ANTHRACENE	SW8270	mg/kg	121	666			295	338	883	1.9	426	2.4ND 516
ATRAZINE	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
BENZALDEHYDE -	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.21ND	6.5ND	2.4ND
BENZO(A)ANTHRACENE	SW8270	mg/kg	127	567			359	375	1530	7.7	374	507

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93 Quanta Resources Superfund Site

Edgewater, New Jersey

	Location) 00	24	T1 44	40.71	T			T		
	Locatio			-24		-10.75		-10.75	SB-26		-10.75	TL14-09
,	Field S	ample ID	SB-24-1.0	SB-24-11	TL14-10.75-15	TL14-10.75-2.0	TL15-10.75-1.0	TL15-10.75-8.0	SB-26-14	TL12-10.75-14.5	TL12-10.75-7.0	TL14-09-5.0
		Date	10/16/2006	10/16/2006	10/13/2006	10/13/2006	10/16/2006	10/16/2006	10/13/2006	10/16/2006	10/16/2006	10/11/2006
		Depth (ft)	0	10	14	1	0	8	13	13.5	5.5	4
<u>.</u>		Depth (ft)	2	- 12	16	3	2	8.5	15	15.5	7.5	6
Parameter	Method	Units										
CARBON TETRACHLORIDE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
CHLOROBENZENE	SW8260	mg/kg	0.37ND	0.40ND	23ND_	22ND		.]	0.50ND	25ND	0.46ND	8.4ND
CHLORODIBROMOMÉTHANE CHLOROETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
CHLOROFORM	SW8260 SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND		-	0.50ND	25ND	0.46ND	8.4ND
CHLOROMETHANE	SW8260	mg/kg mg/kg	0.37ND 0.37ND	0.40ND 0.40ND	23ND 23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
CIS-1,2-DICHLOROETHENE	SW8260	mg/kg	0.37ND 0.37ND	0.40ND 0.40ND	23ND 23ND	22ND 22ND			0.50ND	25ND	0.46ND	8.4ND
CIS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.37ND	0.40ND	23ND 23ND	22ND 22ND		,	0.50ND 0.50ND	25ND	0.46ND	8.4ND
CYCLOHEXANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND 22ND		·	0.50ND	25ND 25ND	0.46ND	8.4ND
DICHLORODIFLUOROMETHANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND 25ND	0.46ND 0.46ND	8.4ND 8.4ND
ETHYLBENZENE .	SW8260	mg/kg	0.073ND	0.080ND	40	40			0.099ND	174	2.7	94
ISOPROPYLBENZENE	SW8260	mg/kg	0.37ND	0.40ND	4.4 J	16 J		.*	0.50ND	30	0.24 J	22
METHYL ACETATE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
METHYL TERT-BUTYL ETHER	SW8260	mg/kg	0.073ND	0.080ND	4.6ND	4.4ND		_.	0.099ND	4.9ND	0.092ND	1.7ND
METHYLCYCLOHEXANE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
METHYLENE CHLORIDE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
O-XYLENE	SW8260	μg/kg	73ND	80ND	16100	90400			99ND	93100	296	55000
STYRENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	(0.46ND	8.4ND
TETRACHLOROETHENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
TOLUENE	SW8260	mg/kg	0.073ND	0.080ND	39	27			0.067 J	71	0.30	57
TRANS-1,2-DICHLOROETHENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
TRANS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND		,	0.50ND	25ND	0.46ND	8.4ND
TRICHLOROETHENE	SW8260	mg/kg	0.37ND	0:40ND	23ND	22ND			0.50ND	25ND	0.46ND	8.4ND
TRICHLOROFLUOROMETHANE VINYL CHLORIDE	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND			0.50ND	25ND	. 0.46ND	8.4ND
	SW8260	mg/kg	0.37ND	0.40ND	23ND	22ND		,	0.50ND	25ND	0.46ND	8.4ND
XYLENES, M & P XYLENES, TOTAL	SW8260	μg/kg	150ND	160ND	42300	180000			200ND	195000	. 786	122000
1,1'-BIPHENYL	SW8260 SW8270	mg/kg	0.15ND 5,7ND	0.16ND 0.087ND	58 46	270			0.20ND	288	1.1	177
2.4,5-TRICHLOROPHENOL	SW8270 SW8270	mg/kg mg/kg	14ND	0.087ND 0.22ND	46 1.5ND	120 0.96ND			1.1	237	0.33	255
2,4,6-TRICHLOROPHENOL	SW8270	mg/kg	14ND	0.22ND 0.22ND	1.5ND 1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
2,4-DICHLOROPHENOL	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND 0.22ND	6.3ND 6.3ND	0.21ND 0.21ND	3.5ND
2,4-DIMETHYLPHENOL	SW8270	mg/kg	14ND	0.22ND	8,5	3.2 J			0.22ND 0.22ND	8.3	0.21ND 0.21ND	3.5ND 11
2,4-DINITROPHENOL	SW8270	mg/kg		0.87ND	5.9ND	3.8ND			0.89ND	25ND	0.83ND	14ND
2,4-DINITROTOLUENE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
2,6-DINITROTOLUENE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND ·	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
2-CHLORONAPHTHALENE	SW8270	mg/kg	5,7ND	0.087ND	0,59ND	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
2-CHLÒROPHENOL	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
2-METHYLNAPHTHALENE	SW8270	mg/kg	5.7ND	0.087ND	251	764			4.4	1480	0.74	1590
2-METHYLPHENOL	SW8270	mg/kg	14ND	0.22ND	3.4	1.2			0.050 J	6.3ND	0.21ND	3.5ND
2-NITROANILINE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
2-NITROPHENOL	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND	•		0.22ND	6.3ND	0.21ND	3.5ND
3&4-METHYLPHENOL 3.3'-DICHLOROBENZIDINE	SW8270	μg/kg	14000ND	220ND	7420	960ND			98 J	6300ND	210ND	3500ND
3,3-DICHLOROBENZIDINE 3-NITROANILINE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
4.6-DINITRO-2-METHYLPHENOL	SW8270 · SW8270	mg/kg mg/kg	14ND 57ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
4-BROMOPHENYL PHENYL ETHER	SW8270 SW8270	mg/kg	5.7ND 5.7ND	0.87ND	5.9ND	3.8ND			0.89ND	25ND	0.83ND	14ND
4-CHLORO-3-METHYLPHENOL	SW8270 SW8270	mg/kg	5.7ND 14ND	0.087ND 0.22ND	0.59ND	0.38ND 0.96ND			0.089ND 0.22ND	2.5ND	0.083ND	1.4ND
4-CHLOROANILINE	SW8270	mg/kg	14ND	0.22ND 0.22ND	1.5ND 1.5ND	0.96ND			0.22ND 0.22ND	6.3ND 6.3ND	0.21ND	3.5ND
4-CHLOROPHENYL PHENYL ETHER	SW8270 SW8270	mg/kg	5.7ND	0.22ND 0.087ND	0.59ND	0.38ND			0.22ND 0.089ND	2.5ND	0.21ND 0.083ND	3.5ND
4-NITROANILINE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.083ND 0.21ND	1.4ND
4-NITROPHENOL	SW8270	mg/kg	57ND	0.87ND	5.9ND J	3.8ND J			0.89ND J	25ND	0.21ND 0.83ND	3.5ND
ACENAPHTHENE	SW8270	mg/kg	1.9 J	0.087ND	293	949			9.1	1050	14 -	14ND 840
ACENAPHTHYLENE	SW8270	mg/kg	3.0 J	0.087ND	5.5	0.38ND			2.1	54	0.47	840 54 J
ACETOPHENONE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
ANTHRACENE	SW8270	mg/kg	5.8	0.087ND	314	1510		İ	23	646	1.2	478
ATRAZINE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0,21ND	3.5ND
BENZALDEHYDE	SW8270	mg/kg	}	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3.5ND
BENZO(A)ANTHRACENE	SW8270	mg/kg	32	0.087ND	247	396			19	399	1.9	319

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93 Quanta Resources Superfund Site Edgewater, New Jersey

	Locatio	n [SB	-19	SB	-20	SE	3-21	SE	3-22	T SE	3-23
	Field Sa	ample ID	SB-19-1.0	SB-19-5.0	SB-20-19.5	SB-20-6.0	SB-21-2.0	SB-21-6.0	SB-22-16	S8-22-2.0	SB-23-11	SB-23-3.0
		Date	10/12/2006	10/12/2006	10/12/2006	10/12/2006	10/13/2006	10/13/2006	10/13/2006	10/13/2006	10/18/2006	10/18/2006
. 1	Start F	Depth (ft)	1 .	4	19	5	1	5	15	10/13/2000		Į.
		Depth (ft)	3	6	20	7	3	7	i	1	10	2
Parameter	Method	Units	3	Ü	20	,	3	/	17	3	12	4
BENZO(A)ANTHRACENE	SW8270	mg/kg									 	
BENZO(A)PYRENE	SW8270	mg/kg	113	503			249	368	1210	8.5	308	455
BENZO(B)FLUORANTHENE	SW8270	mg/kg	90	431			210	288	1120	7.6	247	332
BENZO(G,H,I)PERYLENE	SW8270	mg/kg	69	185	•		116	213	551	4.0	156 J	178
BENZO(K)FLUORANTHENE	SW8270	mg/kg	77	283			185	228	839	6.2	212	347
BIS(2-CHLOROETHOXY)METHANE	SW8270	mg/kg	0.41ND	4.0ND	•		0.35ND	0.42ND	0,74ND	0.082ND	2.6ND	0.96ND
BIS(2-CHLOROETHYL)ETHER	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
BIS(2-CHLOROISOPROPYL)ETHER	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND 0.74ND	0.082ND	2.6ND	0.96ND
BIS(2-ETHYLHEXYL)PHTHALATE	SW8270	mg/kg	0,41ND	4.0ND			8.4 J	0.42ND	0.74ND J	0.082ND	2.6ND	0.96ND J
BUTYLBENZYL PHTHALATE	SW8270	mg/kg	0.41ND J	4.0ND			0.35ND J	0.42ND	0.74ND J	0.082ND J	2.6ND	0.96ND J
CAPROLACTAM	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
CARBAZOLE	SW8270	mg/kg	26	174			132	94	544	0.552115	164 J	205
CHRYSENE	SW8270	mg/kg	115	517			333	355	1670	7.4	335	474
DIBENZO(A,H)ANTHRACENE	SW8270	mg/kg	20 J	69			. 50	56	220	1.7 J	45 J	67
DIBENZOFURAN	SW8270	mg/kg	39	342			280	160	780	0.22	375	279
DIETHYL PHTHALATE	SW8270	mg/kg	0.41ND	4.0ND		•	0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
DIMETHYL PHTHALATE	SW8270	mg/kg	0.41ND	4,0ND			0,35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
DI-N-BUTYL PHTHALATE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
DI-N-OCTYL PHTHALATE	SW8270	mg/kg	0.41ND J	4.0ND			0.35ND J	0.42ND J	0.74ND J	0.082ND	2.6ND J	0.96ND J
FLUORANTHENE	SW8270	mg/kg	379	1820			1320	1120	4510	14	977	1210
FLUORENE	SW8270	mg/kg	60	518			441	222	1010	0.51	370	338
HEXACHLOROBENZENE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	0.96ND
HEXACHLOROBUTADIENE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND 0.74ND	0.082ND	2.6ND	0.96ND
HEXACHLOROCYCLOPENTADIENE	SW8270	mg/kg	4.1ND J	40ND J			3.5ND J	4.2ND J	7.4ND J	0.82ND J	2.6ND 26ND	9.6ND
HEXACHLOROETHANE	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.82ND 3 0.21ND	6.5ND	9.6ND 2.4ND
INDENO(1,2,3-CD)PYRENE	SW8270	mg/kg	63	175			112	186	491	3.9	116	1
ISOPHORONE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND -	0.082ND	2.6ND	203
NAPHTHALENE	SW8270	mg/kg	18 J	1690			434	281	7250	0.002ND	2.6ND 2560 J	0.96ND
NITROBENZENE :	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND	0.74ND	0.082ND	2.6ND	396
N-NITROSO-DI-N-PROPYLAMINE	SW8270	mg/kg	0.41ND	4.0ND			0.35ND	0.42ND 0.42ND	0.74ND 0.74ND	0.082ND	2.6ND 2.6ND	0.96ND
N-NITROSODIPHENYLAMINE	SW8270	mg/kg	1.0ND	9.9ND			0.88ND	1.1ND	1.8ND	0.002ND 0.21ND	6.5ND	0.96ND
PENTACHLOROPHENOL	SW8270	mg/kg	4.1ND J	40ND J			3.5ND J	4.2ND J	7.4ND J	0.21ND 0.82ND J	26ND	2.4ND 9.6ND
PHENANTHRENE	SW8270	mg/kg	308	2420			1860	1260	7.4ND 3	5.7	1370	
PHENOL	SW8270	mg/kg	1.0ND	9.9ND			6.7 J	1.6	98 J	0.21ND	6.5ND	1460 2.4ND
PYRENE	SW8270	mg/kg	295	1400			917	872	3460	12	824	1
<u> </u>	5110275	1 119/119	200	1700			L 311	U12	3400	11	024	1050

TABLE 3a Summary of Analytical Results for Soil Metals-Impacted Area Near Block 93

Quanta Resources Superfund Site Edgewater, New Jersey

						ater, New Jers						
+	Location		SB-	24	TL14-	10.75	TL15-	10.75	SB-26	TL12-		TL14-09
	Field Sa	mole ID	SB-24-1.0	SB-24-11	TL14-10.75-15	TL14-10.75-2.0	TL15-10.75-1.0	TL15-10.75-8.0	SB-26-14	TL12-10.75-14.5	TL12-10.75-7.0	TL14-09-5.0
		Date	10/16/2006	10/16/2006	10/13/2006	10/13/2006	10/16/2006	10/16/2006	10/13/2006	10/16/2006	10/16/2006	10/11/2006
	Start D	epth (ft)	0	10	14	1	0 ,	8	13	13.5	5.5	4
			2	12	16	3	2	8.5	15	15.5	7.5	6
Daramatar		epth (ft)	2	12	10	Ů	_				•	, _
Parameter	Method	Units									7	
BENZO(A)ANTHRACENE	SW8270	mg/kg		0.007ND	177	181			17	240	1.8	214
BENZO(A)PYRENE	SW8270	mg/kg	39	0.087ND	154	183			15	165	2.0	178
BENZO(B)FLUORANTHENE	SW8270	mg/kg	38 J	0.087ND	154 80	66 J			6.7	78	0.96	114
BENZO(G,H,I)PERYLENE	SW8270	mg/kg	24	0.087ND	· ·	184			11	202	1.3	129
BENZO(K)FLUORANTHENE	SW8270	mg/kg	31 J	0.087ND	118	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
SIS(2-CHLOROETHOXY)METHANE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND .	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
BIS(2-CHLOROETHYL)ETHER	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND 0.38ND		į	0.089ND	2.5ND	0,083ND	1,4ND
BIS(2-CHLOROISOPROPYL)ETHER	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND			0.12	2.5ND	0.083ND	1.5 J
BIS(2-ETHYLHEXYL)PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	1.8	0.38ND 0.38ND	<u> </u>		0.089ND	2.5ND	0.083ND	1.4ND
SUTYLBENZYL PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
CAPROLACTAM	SW8270	mg/kg	5.7ND	0.087ND	0.59ND				4.2	198	3.1	254
CARBAZOLE	SW8270	mg/kg	1.9 J	0.087ND	12ND	311			17	337	1.9	273
HRYSENE	SW8270	mg/kg	35	0.087ND	228	417			2.6	31	0.41	38 J
DIBENZO(A,H)ANTHRACENE	SW8270	mg/kg	8.6	0.087ND	34	26 J			8.2	797	8.9	569
DIBENZOFURAN	SW8270	mg/kg	5.7ND	0.087ND	218	688			0.089ND	2.5ND	0.083ND	1.4ND
DIETHYL PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
DIMETHYL PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	. 0.59ND	0.38ND			0.089ND	2.5ND	0.083ND	1.4ND
DI-N-BUTYL PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND	1		0.089ND	2.5ND	0.083ND	1,4ND .
DI-N-OCTYL PHTHALATE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND J				2.5ND 1710	3.4	1140
LUORANTHENE	SW8270	mg/kg	56	0.087ND	691	2430	·		. 53	1 .	. 10	748
LUORENE	SW8270	mg/kg	5.7ND	0.087ND	288	1080			13	1080	0.083ND	1.4ND
HEXACHLOROBENZENE .	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND	1		0.089ND	2.5ND		1.4ND
HEXACHLOROBUTADIENE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND		1	0.089ND	2,5ND	0.083ND	1.4ND J
IEXACHLOROCYCLOPENTADIENE	SW8270	mg/kg	57ND J	0.87ND J	5.9ND J	3.8ND J			0.89ND J	25ND J	_i 0,83ND J	
IEXACHLOROETHANE :	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND			0.22ND	6.3ND	0.21ND	3,5ND
NDENO(1,2,3-CD)PYRENE	SW8270	mg/kg	. 23 .	0.087ND	84	79			6.8	82	1.00	97
SOPHORONE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND			-0.089ND	2.5ND	0.083ND	1.4ND 4770
IAPHTHALENE	SW8270	mg/kg	5.7ND	0.087ND	746	1600			12	5360	11	1
IITROBENZENE	SW8270	mg/kg	5.7ND	0.087ND	0:59ND	0.38ND	1		0.089ND	2.5ND	0.083ND	1.4ND
I-NITROSO-DI-N-PROPYLAMINE	SW8270	mg/kg	5.7ND	0.087ND	0.59ND	0.38ND		,	0.089ND	2.5ND	0.083ND	1.4ND
I-NITROSODIPHENYLAMINE	SW8270	mg/kg	14ND	0.22ND	1.5ND	0.96ND		1	0.22ND	6.3ND	0.21ND	3.5ND
PENTACHLOROPHENOL	SW8270	mg/kg	57ND J	0.87ND J	5.9ND J	3.8ND J			0.89ND J	25ND J	0.83ND J	14ND .
PHENANTHRENE	SW8270	mg/kg	15	0.087ND	1100	3620		I	50	3310	14	2230
PHENOL	SW8270	mg/kg	∞ 14ND	0.22ND	2.8	0.96ND			0.22ND	6.3ND	0.21ND	3,5ND
PYRENE	SW8270	mg/kg	l	0.087ND	572	1530		l	43	1170	2.2	826

Notes:

J: Estimated value

ND: Constituent not-detected above the laboratory method detection limit (MDL) indicated.

mg/kg: milligrams per kilogram or parts per million (ppm)

TABLE 3b Summary of Analytical Results for Soil Pyrite Cinder Impacts Area Quanta Resources Superfund Site Edgewater, New Jersey

						Lagev	ater, New Jers							
	1	Location		6-06	TL1	6-07	TL1	6-09	TL1	7-08	TL17	7-05	TL17-06	TL17-07
	Field S	ample ID	TL16-06-1.0	TL16-06-24	TL16-07-1.0	TL16-07-9.0	TL16-09-2.0	TL16-09-8.0	TL17-08-1.0	TL17-08-4.0	TL17-05-11.5	TL17-05-24	TL17-06-4.0	TL17-07-11
	'	Date	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/12/2006	10/12/2006	10/9/2006	10/9/2006	10/12/2006	10/12/2006
	Start I	Depth (ft)	. 0	23	. 0	8	1	7	0	3	11	23	3	10
	End (Depth (ft)	2 .	25	2	10	3	` 9	. 2	5	11.5	25	5	12
Parameter	Method "	Units					¹ Reddish-Purple			¹ Reddish-Purple			¹ Reddish-Purple	¹ Reddish-Purple
ALUMINUM	SW6010	mg/kg	6310	7090	6530	2780 J	570	7020	7630	300	6860	5920	5770	1540
ANTIMONY	SW6010	mg/kg	6.5	2.4ND	1.2 J	8.5	174	7.8	11 J	205	2.4ND J	2.3ND	77	21
ARSENIC	SW6010	mg/kg	84	169	67 J	1150	1940	498	108 J	1730	116	265	922	5180
BARIUM BERYLLIUM	SW6010	mg/kg	155	, 30	77 J	245	293	97	247 J	400	- 56	24	135	160
CADMIUM	SW6010 SW6010	mg/kg mg/kg	0.29ND 1.2	0.29ND 0.75	0.25ND	0.054ND 0.37ND	1.8ND	0.064ND	0.26ND	0.66ND	0.59ND	0.12ND	0.28ND	0.082ND
CALCIUM	SW6010	mg/kg	22300	974	2.0 J 18000	21300 J	10 14800	12 2100	3.3 J	1.0 .	1.2	0.57ND	2.7	0.64 J
CHROMIUM	SW6010	mg/kg	25	15	25	8.4	3.7ND	10	8930 23 J	264 J 1.3ND ~	17200 . '	678	28600	47700
COBALT	SW6010	mg/kg	8.0	4.0 J	6.3	4.4 J	43	34	20	70	22	14	105	7.7
COPPER	SW6010	mg/kg	135	137	124	882	6170	1980	388	2570	8.0 <u> </u>	3.1 J 316	15 1530	34 4520
IRON	SW6010	mg/kg	62700	10500	21200	46600	257000	70000	34400	134000	15900 :	12800	73600	24100
LEAD	SW6010	mg/kg	751	13	234 J	. 813	7730	1310	1360	38800	193 J	7.3	2840	471
MAGNESIUM	SW6010	mg/kg	3960	2290	4190 J	8960 J	46 J	1500	5370	36 J	3390	2230	643 J	475 J
MANGANESE	SW6010	mg/kg	306	76	207	. 105 J	.54	72	149 J	28	144	91	226	41
NICKEL	SW6010	mg/kg	38	10	28	20	7.7	12	16	2.4ND	14 :	9.5	118	6.2 J
POTASSIUM	SW6010	mg/kg	836.	980	531 J	2580 .	538 J	_ 1430	1040 J	285 J	1350 ;	911	1490	453 J
SELENIUM	SW6010	mg/kg	2.6	2.4ND	1.6 J	6.3	14	11	13	302	2.4ND	-2.3ND	12	2.5 J
SILVER	SW6010	mg/kg	2.1	1.2ND	0.55 J	2.1	24	3.4	2.8 J	26	0.39 J	1.1ND	0.36 J	0.51 J
SODIUM	SW6010	mg/kg	354ND	258ND	268ND	912ND	1200ND	291ND	478ND	1300ND	512ND J	173ND J	842 J	366ND
THALLIUM VANADIUM	SW6010	mg/kg	1.2ND	1.1ND	1.1ND	15ND	31ND	14ND	5.4ND	13ND	1.2ND	1.1ND	30 J	84 J
ZINC	SW6010 SW6010	mg/kg	82 151	13 110	70	14	11	15	46	. 2.0 J	20 .	16	54	8.6
MERCURY	SW7471	mg/kg mg/kg	2.6	0.019 J	185 J 11	200 1.9	3820	4830 3.5	248 J	1940	451 J	31	377	84
ICHROMIUM III	SW7196	mg/kg	2.0	0.0133	25	8.4	5.6	3.5	2.0 23	69 2.6ND	0.058	0.16	6.3	0.33
HEXAVALENT CHROMIUM	SW7196	mg/kg	•		,25	1.4 J	j l		23	1.3ND	**		105	7.7
OXIDATION-REDUCTION POTENTIAL	ASTM D1498	mv			234	267			120	313	,		1.4ND	1.6ND
pH	SW9045	S.U.			8.0	8.1			12	6.5	. }		112 9.1	144 7.5
AROCLOR-1016	SW8082	mg/kg	0.11ND	0.039ND	0.11ND	0.049ND	0.041ND	0,13ND	0.11ND	0.043ND	0,039ND	0.038ND	3.1	7.5
AROCLOR-1221	SW8082	mg/kg	0.11ND	0.039ND	0.11ND	0.049ND	0.041ND	0.13ND	0.11ND	0.043ND	0.039ND	0.038ND		
AROCLOR-1232	SW8082	mg/kg	0.11ND	0.039ND	0.11ND	0.049ND	0.041ND	0.13ND	0.11ND	0.043ND	0.039ND ::	0.038ND		:
AROCLOR-1242	SW8082	mg/kg	0.11ND	0.039ND	0.11ND ·	0.049ND	0.041ND ·	0.13ND	0.11ND	0.043ND	0.039ND	0.038ND	1.	
AROCLOR-1248	SW8082	mg/kg	0.11ND	0.039ND	0.11ND .	0.049ND	0.041ND	0.13ND	0.11ND	0.043ND	0.039ND	0.038ND		
AROCLOR-1254	SW8082	mg/kg	0.11ND	0.039ND	0.11ND	0.049ND	0.041ND	0.13ND	0.11ND	0.043ND	0.039ND	0.038ND		
AROCLOR-1260	SW8082	mg/kg	0.11ND	0.039ND	0.11ND	0.049ND	0.041ND	0.13ND	0.11ND	0.043ND	0.039ND	0.038ND		
1;1,1-TRICHLOROETHANE 1,1,2,2-TETRACHLOROETHANE	SW8260 SW8260	mg/kg	0.36ND 0.36ND	0.30ND	0.68ND	0.59ND '	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
1,1,2-TRICHLOROETHANE	SW8260	mg/kg mg/kg	0.36ND	0.30ND 0.30ND	0.68ND 0.68ND	0.59ND 0.59ND	0.35ND 0.35ND	2.3ND 2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
1,1,2-TRICHLOROTRIFLUOROETHANE		mg/kg	0.36ND	0.30ND	0.68ND	0.59ND 0.59ND	0.35ND 0.35ND	2.3ND 2.3ND	0.29ND 0.29ND	0.29ND 0.29ND	0.29ND 0.29ND	0.29ND		
1,1-DICHLOROETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND .	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND 0.29ND	1	
1,1-DICHLOROETHENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND	}	
1,2,4-TRICHLOROBENZENE	SW8260	mg/kg	0:36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
1,2-DIBROMO-3-CHLOROPROPANE	SW8260	mg/kg	0.72ND	0.61ND	1.4ND	1,2ND	0.69ND	4.5ND	0.58ND	0.58ND	0.57ND	0.58ND		
1,2-DIBROMOETHANE	SW8260 .	mg/kg	0.072ND	0.061ND	0.14ND	0.12ND	0.069ND	0.45ND	0.058ND	0.058ND	0.057ND	0.058ND		
1,2-DICHLOROBENZENE	SW8260	mg/kg	_ 0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND :	0.29ND		
1,2-DICHLOROETHANE	SW8260	mg/kg	0.072ND	0.061ND	0.14ND	0.12ND	0.069ND	0.45ND	0.058ND	0.058ND	0.057ND J	0:058ND J		
1,2-DICHLOROPROPANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
1,3-DICHLOROBENZENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
1,4-DICHLOROBENZENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND	<u>'</u>	
2-BUTANONE	SW8260	mg/kg	0.72ND	0.61ND	1.4ND	1.2ND	0.69ND	4.5ND	0.58ND	0.58ND	0.57ND	0.58ND		
2-HEXANONE	SW8260	mg/kg	0.36ND J	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND ·	0.29ND		
4-METHYL-2-PENTANONE	SW8260 SW8260	mg/kg	0.36ND	0.30ND J	0.68ND J	0.59ND J	0.35ND J	2.3ND J	0.29ND	0.29ND	0.29ND	0.29ND		/
ACETONE BENZENE	SW8260 SW8260	mg/kg	0.72ND 0.072ND	0.61ND	1.4ND	1.2ND	0.69ND	4.5ND	0.58ND	0.58ND	0.57ND	0.58ND		
BROMODICHLOROMETHANE	SW8260	mg/kg mg/kg	0.072ND 0.36ND	0,20 0.30ND	0.14ND 0.68ND	0.077 J 0.59ND	0.32	25 2.3ND	0.058ND	0.058ND	0.057ND	0.058ND		
BROMOFORM	SW8260	mg/kg	0.36ND	0.30ND 0.30ND	0.68ND	0.59ND 0.59ND	0.35ND 0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
	0,10200	mg/ng [U.30ND	U.JUINU	U.UUIUU.U	עאופכ.ט	עאופפיה	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND	L	

TABLE 3b

Summary of Analytical Results for Soil Pyrite Cinder Impacts Area Quanta Resources Superfund Site Edgewater, New Jersey

	·				·		ater, New Jers			<u> </u>				
		Location		6-06		6-07	TL1	6-09	TL1	7-08	TL1	7-05	TL17-06	TL17-07
	Field S	Sample ID	TL16-06-1.0	TL16-06-24	TL16-07-1.0	TL16-07-9.0	TL16-09-2.0	TL16-09-8.0	TL17-08-1.0	TL17-08-4.0	TL17-05-11.5	TL17-05-24	TL17-06-4.0	TL17-07-11
		Date	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/12/2006	10/12/2006	10/9/2006	10/9/2006	10/12/2006	10/12/2006
	Start	Depth (ft)	0	2,3	0	8	1	7	0	3	11	23	3 .	10
	End	Depth (ft)	2 .	25	2	10	3	9	2	5	11.5	25	5	12
Parameter	Method	Units					¹ Reddish-Purple			¹ Reddish-Purple		- 20	Reddish-Purple	1Reddish-Purple
BROMOMETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND ·	0.29ND		
CARBON DISULFIDE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0:35ND	2.3ND	0.29ND	0,29ND	0.29ND	0.29ND		
CARBON TETRACHLORIDE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND J	0.29ND J		
CHLOROBENZENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND -	0.29ND	0.29ND	0.29ND		
CHLORODIBROMOMETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND '	0.29ND		
CHLOROETHANE .	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
CHLOROFORM	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND ·	0.29ND	0.29ND	0.29ND	0.29ND		
CHLOROMETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
CIS-1,2-DICHLOROETHENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
CIS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
CYCLOHEXANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
DICHLORODIFLUOROMETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
ETHYLBENZENE	SW8260	mg/kg	0.072ND	1.2	0.14ND	0.50	0.22	25	~ 0.058ND	0.058ND	0.057ND	· 0.058ND		
ISOPROPYLBENZENE	SW8260	mg/kg	0.36ND	0.11 J	0.68ND	0.24 J	0.94	· 2.1 J	0.29ND	0.29ND	0.29ND	0.29ND		
METHYL ACETATE	SW8260	mg/kg	0.16 J	0.30ND	0.68ND	0.21 J	0.24 J	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND	**	
METHYL TERT-BUTYL ETHER METHYLCYCLOHEXANE	SW8260	mg/kg	0.072ND	0.061ND	0.14ND	0.12ND	0.069ND	0.45ND	0.058ND	0.058ND	0.057ND	0.058ND		
METHYLENE CHLORIDE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		•
O-XYLENE	SW8260 SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	. 0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	. 0.29ND	·	
STYRENE	SW8260	μg/kg	72ND	566	140ND	319	319	42700	58ND	58ND	57ND	58ND	1	
TETRACHLOROETHENE	SW8260	mg/kg	0.36ND 0.36ND	0.30ND	0.68ND	0.59ND	0.35ND	42	0.29ND	0.29ND	0.29ND	0.29ND		
TOLUENE	SW8260	mg/kg	0.072ND	0.30ND	0.68ND	0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
TRANS-1,2-DICHLOROETHENE	SW8260	mg/kg mg/kg	0.36ND	0.18 0.30ND	0.14ND 0.68ND	0.10 J 0.59ND	0.48	67	0.064	0.058ND	0.057ND	0.058ND		
TRANS-1,3-DICHLOROPROPENE	SW8260	mg/kg	0.36ND	0.30ND 0.30ND	0.68ND	0.59ND 0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
TRICHLOROETHENE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND 0.59ND	0.35ND	2.3ND	0.29ND	0.29ND	0.29ND	0.29ND		
TRICHLOROFLUOROMETHANE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND 0.35ND	2.3ND 2.3ND	0.29ND 0.29ND	0.29ND	0.29ND	0.29ND		
VINYL CHLORIDE	SW8260	mg/kg	0.36ND	0.30ND	0.68ND	0.59ND	0.35ND 0.35ND	2.3ND	0.29ND 0.29ND	0.29ND	0.29ND	0.29ND		
XYLENES, M & P	SW8260	µg/kg	140ND	583	270ND	226 J	747	91800	347	0.29ND 120ND	0.29ND 110ND	0.29ND		
XYLENES, TOTAL	SW8260	mg/kg	0.14ND	1.2	0.13 J	0.54	1.1	134	0.35	0.12ND	0.11ND	120ND 0.12ND		
1,1'-BIPHENYL	SW8270	mg/kg	2.8 J	1.9 J	17 J	8.8 J	28	58	13 J	0.036 J	0.079ND	0.12ND 0.077ND		
2,4,5-TRICHLOROPHENOL	SW8270	mg/kg	1.0ND	. 0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND (0.19ND		
2,4,6-TRICHLOROPHENOL	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND ·	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		
2,4-DICHLOROPHENOL	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1,1ND	0.93ND	0.21ND	0.20ND	0.19ND		
2,4-DIMETHYLPHENOL	SW8270	mg/kg	1.0ND	0.98ND	2.8	1.2ND	1.1 J	2.3	0.93ND	0.21ND	0.20ND	0.19ND		
2,4-DINITROPHENOL	SW8270	mg/kg	4.0ND	3.9ND	3.9ND	4.9ND	4.2ND	4.4ND	3.7ND	0.85ND	0.79ND	0.77ND		
2,4-DINITROTOLUENE	SW8270	mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		
2,6-DINITROTOLUENE	SW8270	mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND .	0.077ND		
2-CHLORONAPHTHALENE	SW8270	mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND *	0.077ND		
2-CHLOROPHENOL	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		
2-METHYLNAPHTHALENE	SW8270	mg/kg	9.0 J	7.4 J	60	7.1 J	133	471	78 J	0.18 J	0.079ND	0.077ND		
2-METHYLPHENOL	SW8270	mg/kg	0.20 J	0.98ND	3.5	1.2ND	0.59 J	0.64 J	0.20 J	0.21ND	0.20ND	0.19ND		
2-NITROANILINE	SW8270	mg/kg	1.0ND	. 0.98ND	0.98ND	1.2ND .	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		•
2-NITROPHENOL	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1,2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	. 0.19ND		
3&4-METHYLPHENOL	SW8270	µg/kg	1150	282 J	8840	1200ND	755 J	1420	930ND	210ND ·	200ND	190ND		·
3,3'-DICHLOROBENZIDINE	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND J	0.21ND	0.20ND	0.19ND		
3-NITROANILINE	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		-
4,6-DINITRO-2-METHYLPHENOL	SW8270	mg/kg	4.0ND	3.9ND	3.9ND	4.9ND	4.2ND	4.4ND	3.7ND J	0.85ND	0.79ND	0.77ND		
4-BROMOPHENYL PHENYL ETHER	SW8270	mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND J	0.085ND	0.079ND	0.077ND	[
4-CHLORO-3-METHYLPHENOL	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND	,	
4-CHLOROANILINE	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		
4-CHLOROPHENYL PHENYL ETHER	SW8270	mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		
4-NITROANILINE	SW8270	mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		
4-NITROPHENOL	SW8270	mg/kg	4.0ND	3.9ND	3.9ND	4.9ND	4.2ND	4.4ND	3.7ND J	0.85ND J	0.79ND J 1.	0.77ND J		
ACENAPHTHENE	SW8270	mg/kg	78	23	208	40	117	94	189	0.12	0.079ND	0.077ND	'	
ACETOPHENONE	SW8270	mg/kg	8.1 J	1.4 J	17 J	8.3 J	6.6 J	100	17	0.028 J	0.079ND	0.077ND		
ACETOPHENONE	SW8270	mg/kg	0.25 J	0.98ND	0.28 J	0.25 J	0.45 J	2.1	0.93ND	0.21ND	0.20ND	0.19ND		

TABLE 3b Summary of Analytical Results for Soil Pyrite Cinder Impacts Area

Quanta Resources Superfund Site

Edgewater, New Jersey

						ater, New Jers		· · · · · · · · · · · · · · · · · · ·					
	Location		16-06	ļ	6-07	TL16			7-08	TL1	7-05	TL17-06	TL17-07
·	Field Sample ID	TL16-06-1.0	TL16-06-24	TL16-07-1.0	TL16-07-9.0	TL16-09-2.0	TL16-09-8.0	TL17-08-1.0	TL17-08-4.0	TL17-05-11.5	TL17-05-24	TL17-06-4.0	TL17-07-11
	Date	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	.10/12/2006	10/12/2006	10/9/2006	10/9/2006	10/12/2006	10/12/2006
	Start Depth (ft)	0	23	0	8	. 1	7	0	3	11	23	3	10
	End Depth (ft)	2	25	2	10	3	9	2	5	11.5	25	5	12
Parameter	Method Units	· · · · · · · · · · · · · · · · · · ·				¹ Reddish-Purple	·····		¹ Reddish-Purple			¹ Reddish-Purple	¹ Reddish-Purple
ANTHRACENE	SW8270 mg/kg	106	30	309	75	57	133	282	0.33	0.079ND	0.077ND	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
ATRAZINE	SW8270 mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	.1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		
BENZALDEHYDE	SW8270 mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		1
BENZO(A)ANTHRACENE	SW8270 mg/kg	210	32	942	79	36	78	315	0.91	0.079ND	0.077ND		ı
BENZO(A)ANTHRACENE	SW8270 mg/kg			·			73						
BENZO(A)PYRENE	SW8270 mg/kg	200	26	941	60	20 J	48	305	0.72	0.079ND	0.077ND		l
BENZO(B)FLUORANTHENE	SW8270 mg/kg	216	20	967	46	21 J	31	318	0.85	0.079ND	0.077ND		
BENZO(G,H,I)PERYLENE	SW8270 mg/kg	112	- 13 J	553	23 J	11 J	21	201	0.40	0.079ND	0.077ND		,
BENZO(K)FLUORANTHENE	SW8270 mg/kg	145	18	632	41	12 J .	. 27	221	0.63	0.079ND	0.077ND		
BIS(2-CHLOROETHOXY)METHANE	SW8270 mg/kg	0.40ND	0.39ND	. 0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		, 1
BIS(2-CHLOROETHYL)ETHER	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		
BIS(2-CHLOROISOPROPYL)ETHER	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		,
BIS(2-ETHYLHEXYL)PHTHALATE	SW8270 mg/kg	2.0 J	0.48 J	0.39ND	0.49ND	0.46 J	0.44ND	1.6 J	0.18	0,079ND	0.12		
BUTYLBENZYL PHTHALATE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	1.1 J	0.085ND	0.079ND	0.077ND		1
CAPROLACTAM	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		.
CARBAZOLE .	SW8270 mg/kg	32	16 J	257	12	24	14	100	0.094	0.079ND	0.077ND	,	.
CHRYSENE	SW8270 mg/kg	223	31	965	73	32	76	343	1.00	0.079ND	0.077ND		,
DIBENZO(A,H)ANTHRACENE	SW8270 mg/kg	. 49	5.4 J	200	11 J	4.2 J	8.2 J	63	0.17	0.079ND	0.077ND		
DIBENZOFURAN	SW8270 mg/kg	36	18 J	109	29	98	80	122	0.091	0.079ND	0.077ND		
DIETHYL PHTHALATE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		,
DIMETHYL PHTHALATE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		
DI-N-BUTYL PHTHALATE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND J	0.085ND	0.079ND	0.077ND		1
DI-N-OCTYL PHTHALATE	SW8270 mg/kg	0.40ND J	0.39ND J	0,39ND J	0.49ND J	0.42ND J	0.44ND J	0.37ND J	0.085ND	0.079ND	0.077ND		1
FLUORANTHENE	SW8270 mg/kg	525	87	2170	196	164	186	855	2.1	0.079ND	0.077ND		ı .
FLUORENE	SW8270 mg/kg	59	22	204	51	116	164	212	0.15	0.079ND	0.077ND		1
HEXACHLOROBENZENE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND J	0.085ND	0.079ND	0.077ND		1
HEXACHLOROBUTADIENE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND -	0.077ND		1
HEXACHLOROCYCLOPENTADIENE	SW8270 mg/kg	4.0ND J	3.9ND J	3.9ND J	4.9ND J	4.2ND J	4.4ND J	3.7ND J	0.85ND J	0.79ND	0.77ND		~
HEXACHLOROETHANE	SW8270 mg/kg	. 1,0ND	0.98ND	0.98ND	1,2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.19ND		1
INDENO(1,2,3-CD)PYRENE	SW8270 mg/kg	115	13 J	540	24 J	11 J	19 J	179	0.36	0.079ND	0.077ND		,
ISOPHORONE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.077ND		,
NAPHTHALENE	SW8270 mg/kg	9.5 J	25	279	24 J	208	1300	58	0.27	0.079ND	0.058 J		, ,
NITROBENZENE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND	0.44ND	0.37ND	0.085ND	0.079ND	0.038 3 0.077ND		,
N-NITROSO-DI-N-PROPYLAMINE	SW8270 mg/kg	0.40ND	0.39ND	0.39ND	0.49ND	0.42ND 0.42ND	0.44ND	0.37ND 0.37ND	0.085ND 0.085ND	0.079ND	0.077ND 0.077ND		
N-NITROSODIPHENYLAMINE	SW8270 mg/kg	1.0ND	0.98ND	0.98ND	1.2ND	1.0ND	1.1ND	0.93ND J	0.065ND 0.21ND	0.20ND	0.077ND 0.19ND		ı
PENTACHLOROPHENOL	SW8270 mg/kg	4.0ND J	3.9ND J	3.9ND J	4.9ND J	4.2ND J	4.4ND J	3.7ND J	0.85ND J	0.79ND J	0.73ND 0.77ND J		ı
PHENANTHRENE	SW8270 mg/kg	228	111	1390	238	311	4.410.5	764	1.5	0.79ND 3	0.77ND 3		ı
PHENOL	SW8270 mg/kg	0.30 J	0.98ND	5.6	1.2ND	1.0ND	1.1ND	0.93ND	0.21ND	0.20ND	0.077ND 0.19ND		,
PYRENE	SW8270 mg/kg	381	70	1490	169	1.0ND	1.110	0.93ND 614	1.8	0.20ND 0.079ND	0.19ND 0.077ND		ı
	GVV0270 Ing/kg	301	/0	1490	109	110	192	014	1.0	U.U/9NU -	0.077ND	l	

mg/kg: milligrams per kilogram or parts per million (ppm)

Notes:

1: These samples include those that were taken from discrete intervals of reddish-purple, or dusky red discolored soils.

ND: Constituent not-detected above the laboratory method detection limit (MDL) indicated.

TABLE 5 Comparison of SI Metals Results

Quanta Resources Superfund Site Edgewater, New Jersey

	11	oil Cleanup eria	USEPA Reg	ion 9 PRGs	¹ NJDEP	Historic Fill D	Database	Metals Impa	les Collected acts Outside I d Plant Area	Fmr. Sulfuric		Samples Co Pyrite Cind (12)			es with Evider inder-Impacts	
Parameter	Non- : Residential	Residential	Industrial	Residential	Minimum	Maximum	Average .	Minimum Detected Value	Maximum Detected Value	Geometric Mean	Minimum Detected Value	Maximum Detected Value	Geometric Mean	Minimum Detected Value	Maximum Detected Value	Geometric Mean
ALUMINUM	N/A	N/A	76000	100000			,	938	10200	4011	300	7630	3433	300	5770	1110
ANTIMONY	340	14	410	31				1.9	41	2.1	1.2	205	10	21	205	87
ARSENIC	20	20	2	0.39	0.05	1098	13.2	2.9	220	17	67	5180	419	922	5180	2001
BARIUM	47000	700	67000	5400		-	,	12	195	55	24	400	118	135	400	224
BERYLLIUM	2	2	1900	150	0.01	79.7	1.23	0.22	1.90	0.21	ND	ND	0.12	0.04	0.90	0.20
CADMIUM	100	39	450	37	0.02	510	11.1	0.22	2.8	0.39	0.64	12	1.4	0.64	10	2.04
CALCIUM	/ N/A	N/A	N/A	N/A				295	42800	4519	264	47700	6796	264	47700	8545
CHROMIUM .	N/A	N/A	450	210				5.7	84	15	7.70	105	12	0.65	105	6
COBALT	N/A	N/A	1900	900				2.0	17	5.7	3.1	70	13	15	70	35
COPPER	600	600	41000	3100				9	262	47	124	6170	679	1530	6170	3236
IRON	N/A	N/A	100000	24000				3320	76900	14132	10500	257000	40499	24100	257000	88406
LEAD	600	400	800	400	0.28	- 10700	574	5.5·	1960	99	7.3	38800	592	471	38800	4475
MAGNESIUM	N/A	N/A	N/A	N/A				192	6750	1679	36	8960	1216	36	643	150
MANGANESE	N/A	N/A	20000	1800				21	987	108	28	306	100	28	226	61
NICKEL	2400	250	20000	1600				5.20	83	15	6.20	118	14	1.20	118	9
POTASSIUM	N/A	. N/A	N/A	N/A				128	1230	488	285	2580	879	285	1490	567
SELENIUM	3100	63	5100	390				1.0	28	1.7	1.6	302	6	2.5	302	19
SILVER	4100	110	5100	390			,	0.66	1.1	0.66	0.36	26	1.6	0.36	26	3
SODIUM	N/A	N/A	N/A	N/A				599	2930	225	842	842	252	183	842	495
THALLIUM	2	÷2	68	5				ND	ND	0.76	30	84	3	6.50	84	22
VANADIUM	7100 :	370	1000	78				3.5	56	18	2.0	82	19	2.00	54	10
ZINC	1500	1500	100000	24000	2.45	10900	575	22,	561	77	31	4830	340	84	3820	696
MERCURY	270	14	310	23		`		0.04	10	0.26	0.02	69	1.4	0.33	69	5

Notes:

N/A: Not Available

^{1:} Values taken from Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005).

^{2:} These samples represent those that were taken in order to better define the impacts of the former sulfuric acid plant operations area and include samples that did not have visual evidence of impacts (e.g. reddish-purple discolored soils).

^{3.} These samples include those that were taken from discrete intervals of reddish-purple, or dusky red discolored soils

Values highlighted in bold and italics are at or above residential and/or industrial values for NJDEP Soil Cleanup Criteria or USEPA Region 9 Preliminary Remediation Goals

For samples where constituents were not detected (ND), 1/2 of the detection limit was used for calculations

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm)

TABLE 6
Summary of Metals Analytical Results for Cinder/Ash Impacted Intervals
Quanta Resources Superfund Site
Edgewater, New Jersey

		1		ws													_=				-			-										
				1	ı		Т	Τ	т	1	ī		1			Τ	SW 6010			-												SI	W 7196	SW747
	Purple-	Sampled	NOM.	ANC	ñ	IC (Leached)		/ (Leached)	WOI	W	JM (Leached)	W _O	WOI	IUM (Leached)		~			 eached)	Wnis	VESE.		M.		M (Leached)		eached)		_	>		III W	ENT	
	Reddish	Interval (ft.	I OMI	J J J	SEN	SEN	ASIUM .	NOIR	IRYCI.	DMIC	DWIG	LOID	ROM	ROM.	BALT	PPEA	z	g	AD (Le	GNES	NGA.	, KE	LASSI	ENIC	EN I	E E	ER (L	2	L CV	AD C		OMIU	AVAL	CUR
Location MW-103DS	Color	bgs) 5.0-6.0	₹	₹	5.1	₹	<u> </u>	8	- 8	1 8	3	_ გ	- 5	1 5	8	8	Ĕ.	3	LÉ	₹	Σ A	2	Š.	SEL	SEL	SILV	SEL	000	Ŧ	A A	ZINC	CH3	- 포포	M. M.
		3.4-3.6			12	 	 	 	-	 		-	18	-		 		415				ļ											9.5 ND	
MW-105A		3,6-3,9			5.5				1.				"	-				270	-		 		-				<u> </u>	-					1.8 ND	
MW-116B		0.0-0.16 1.75-2.0			19 6.7		 		-				32					408									<u> </u>						1.7 ND 8.3 ND J	
14144-1100		4.5-5.0	*****		21	+	 	 	 	-		-		-			-	55 451			<u> </u>	ļ		ļ									1.7 ND	
		0.0-0.16				Γ.		1									1	451			-		 	- , .	 		 						9.9 ND	
MW-117B		0,0-0,10			10				1				18					120				1					l .'						1,6 ND J	,
		4.0-5.5			·										_																		1.0 100 3	4
				<u> </u>	13	 							ļ				ļ	79					<u> </u>		<u> </u>				_				1.7 ND	
SB-02		0.0-0.16			7.7			,				1	19					118																
JU-U2		9.5-10.0											1,3		-			110				<u> </u>	 				<u> </u>						1.8 ND	
		0.0-0.16		 	18	 	-	 	-	-			13					86															1.9 ND	
SB-03		3.5-4.0			13					 		-	13					96 35			-												1.8 ND J	J
\$B-06		1.5-2.0			33													133			 												1.6 ND 1.8 ND	+
TL14-09		4.0-6.0	2810	2.9 ND	16		43		0.38 J	0.73 ND		42800	8.3																	-:			1.0 10	
TL16-07		0.0-2.0	6530	1.2 J		0.041.	1 75	0.016 J	0.35 ND		0.004 ND			0.01 ND	5.6 J 6.3	32 124	11600 21200	82 234 J	0.0064	2590 4190 J	79 207	15 28	557 J 531 J	2.1 J 1.6 J	0.0020	1.5 ND	2010 110	327 ND	1.5 ND	55	65	8.3	1.4 ND	0.7
TL17-08		0.0-2.0	7630	11 J		0.064 ND	247 J	0.0062 ND	0.26 ND	3.3 J	0.005 ND			0.01 ND		388	34400	1360	0.5004		149 J		1040 J		0.0038 J	0.55 J	0.010 ND		1.1 ND 5.4 ND		185 J 248 J		 	2.0
MW-103 MW-105		3.0-4.0 5.0-5.0	· · · · ·		8.2 53.7	-	 		-	 			5.5 53.7					108										110110			2400	25	 	1 2.0
MW-106		9.0-10.0			28.5	1	İ			 			20.4	-			-	492 108			-			· ·				ļ						
MW-109 MW-110	ļ <u>.</u>	7.0-7.5 12,0-13,0			66.8					I			56.5					161						_									 	+
MW-114B		1.5-2.0			666 10.4	 	 						9.1					1720 0.000083 UJ																
MW-119A		14.5-15.0			27											-		143															13 ND	
MW-119B SB-01		9.5-10.0 1.0-1.5			47 8,9	 	<u> </u>	 		-			29				`	1040															2 ND	+
		1.0-1.5			7.3	 		-	-	 			9.2				-	39 75			-						1					-	2.5 ND	
SB-04		3.0-3.5			10								0.2					592					-			· · · · · ·					·		1.8 ND 1.8 ND	
SB-10		3.0-4.0 0.0-0.16	3390 15700	1 ND 0.89 ND	11		112		0.23 J 4.4	0.19 J 0.8		5640 12900	11	-	5.4	42	8730	98		915	54	13	307	1.3 J		0.24 ND		498	1.2 ND	14	76		1.9 ND	0.42
SB-11		1.5-2.0	4970	0.91 ND			49		0.24 J	0,29 J		3950	· 72		23 6.7	472 88	30600 16800	348 123		7350 1750	333 114	173 24	1030 235	2.5 1.1 ND		0.67 0.22 ND	:	1450	1.1 ND				1.6 ND	0.3
		4.5-5.0	3340	0.97 ND			55		5.8	0.26 J		10600	19		4.6	47	8740	82		925	77		323	1.4 J	 	0.23 ND		539 327	1.1 ND				1.7 ND 1.8 ND	2.2 .
SB-13	-	0,0-1,0 1.0-2.0	5170 J 12100 J	24 3.1 ND	913 73	 	179 176		0.36 J 0.45 J	0.9 0.097 ND		14400 30800	41 34		7.1	307 221	38300 J 34100 J	636 402		1780	149	43	681	1.7 ND		1.8		437	4.8	42	338		9.4 ND	2.7
SB-19		1.0-3.0	5560	16	118		118		0.34 ND	0.59 ND		19000	18		17	138	22100	1960		4310 1840	247 117	38 18	1140 535 J	1,1 ND 28		0.91 0.67 J		1090 512 ND	1.7 J 1.2 ND		232 184		1.7 ND	0.65
SB-20		4.0-6.0 5.0-7.0	1150 4420	2,3 ND 2,4 ND	14		21 J 53	-	0.13 ND 0.71	0.57 ND 2.8		1840	5.7		2.3 J	16	4790	70		192 J	21	5.7	154 J	1 J		1.1 ND		203 ND	1.1 ND		40		 	0.22
SB-21		1.0-3.0	10200 J	2 J	18		94		1.9	0.52 ND		10500 10200	32 57 J		11	141 252	76900 23600	715 286		2350 6750	987 233 J	32 83 I	345 J 835 J	1,5 J. 1,1 J		1,2 ND 1 ND		113 ND 863 J	1,2 ND	56	218		1	0.098
30-21		5.0-7.0	4520	2.6 ND	13		48		0.59 J	0.65 ND		4360	18		5.5 ND	45	13700	297		1280	95	14	422 J	1.4 J		1.3 ND		372 ND	1 ND		227		+	0.44 J 0.25
\$B-22		1.0-3.0	6740 938	2.3 ND	9.4	 	195 15 J		0.29 J 0.073 ND	0.63 ND 0.58 ND		40800 1090	84 13		5.6 J 2 J	91	31800	790		2360	361	23	1020	2.5 ND		1.3 ND		369 ND	13 ND	26	117	84	1.2 ND	1.3
SB-23		2.0-4.0	7010	2.9 ND	27		123		0.36 J	0.72 ND		6290	36		7.4	16 96	3320 17100	56 181		268 J 2280	21 141	5.2 17	128 J 957	1.8 J 3.2 ND		1.2 ND		236 ND	1.2 ND		25	13	1.1 ND	
SB-24	ļ	0.0-2.0 1.0-3.0	5050 5330	3.9 J 7.1	38 J 111	ļ	73 124	ļ	0.2 ND 0.27 J			11100	12		6.7 J	262	25300	323 J		6530	221	19 J	541 J	1.5 J		0.75 J		282 ND	1.4 ND 1.1 ND	23 35	120 181 J	12	0.56 J	0.65
TL14-10.75		14.0-16.0	6050	3.4 ND	2.9 J		20 J		0.27 J	1.3 0.85 ND		3580° 8540	17 · 12		9.5	178	25300	731	-	2490	101		424 J	3.7		1.1		402 ND	5.5 ND	47	561 .			2.7
SB-W21		9.0-9.5	5390	1.16	74.5		91.5		0.23 ND	0.85 ND		9900	13.1		3.3 J 4.64	13 34.6	9550 14500	23 42.6		2380 1950	63 118	7.4	1230 573	3.4 ND 2.32		1.7 ND 0.58		2930	1.7 ND	14	28		<u> </u>	0.52
MW-M		9.2-9.7		27.0	0.0023													74.0			'''	17.7	3/3	2.32		0.56	· ·	611	0.251	14.6	40.7		+	0.137
GZA-32 GZA-43		2.0-4.0 4.0-4.5		37.8 0.662 ND	3.29 5.240	-		-	0.103 J 0.807 J	0.205 J 0.605 J						66.5		10.8				28.7		0.514 J		0.081 ND			0.541 ND		41.5			0.043
GZA-45		2.0-3.0		0.474 ND	30.8			_	0.289 J	0.048 ND						15.3		26.2				20.4		0.688 ND	 	0.159 ND		T				24.4		0.044
GZA-46	1	4.0-5.0		33.1	137				0.269 J	0.812						25 128		75.4 412				33.7		0.867 J		0.145 J			0.762 ND		52.2	6.65		0.126
	 	9.0-10.0		0.498 ND		1	-		0.607 J	12				· · · · · · · · · · · · · · · · · · ·		295	L 1	412		!		62.1	ı i	ا 2.2	1	0.232 J		- 1	0.611 ND	- 1	275	67.6	1	2.2

TABLE 6 Summary of Metals Analytical Results for Cinder/Ash Impacted Intervals Quanta Resources Superfund Site Edgewater, New Jersey

	1	1	r	4		SW 6010																												
			ļ	r		T -							,		,		SW 6010	γ				,	_,									SW	7196	SW7471
Location	Purple- Reddish Color	Sampled Interval (ft. bgs)	ALUMINUM	ANTIMONY	ARSENIC	ARSENIC (Leached)	BARIUM	BARIUM (Leached)	BERYLLIUM	САРМІИМ	CADMIUM (Leached)	САГСІИМ	CHROMIUM	CHROMIUM (Leached)	СОВАLТ	COPPER	IRON	LEAD	LEAD (Leached)	MAGNESIUM	MANGANESE	NICKEL	POTASSIUM	SELENIUM	SELENIUM (Leached)	SILVER	SILVER (Leached)	Wnidos	HALLIUM	VANADIUM	ZINC	CHROMIUM III	- HEXAVALENT SHROMIUM	MERCURY
GZA-49		5.0-6.0		0.392 ND					0.478 J	0.12 J						10.2		21.4				9.93		0.408 ND		0.094 ND	T		0.63 ND		242	10.6		0.015
LB-18		3.5-4.0	4500	2.5 ND	13		140		0.76 ND	0.76 ND		11000	12	}	7	210	8700	160		630 ND	120	16	670	2.5 ND		3.2 ND		630 ND	1.5 ND		180	10.0	r	0.39
LB-21	ļ	2.5-3.0	4300	4.9	110	<u> </u>	62	····	0.81	2.6		5000	27	<u></u>	7.2	110	30000	830		1700	260	35	580 ND	3.3		2,9 ND		750	2.1		870	-		0.55
LB-24		4.0-4.5	11000	22	290		320		1.0	0.81 ND		15000	- 42		13	200	31000	1000		1300	260	36	1800	3.3		3.4 ND				 				
LB-25		4,5-5,0	4500	5.4	26		630		0.95 ND	0.95 ND		6600	15		7.9	260	16000	2100				30						890	1.6 ND	23	190			2.5
LB-26		4.0-4.5	6100	2.3 ND	77		71		0.69 ND			36000	25	 	8.0	110	16000	150		1100	130	34	790 ND	3.9		4 ND	ļ	1600	1.9 ND	1	550			1.5
LB-4		3,5-4,0	5900	79	140		150		0.72 ND	1.5		5000	41	 	8.9	150	37000	970	 -	3000	250	1100	910	2.1 ND		2.9 ND		570 ND	1.4 ND	25	160	1		0.49
MW-29		4.5-5.0	9500	2.5 ND	39	T-11-1-1	710	-	0.76 ND			5400	28		5.7	100	35000	380		1200 2600	320	. 89	1000	2.4 ND		3 ND		600 ND	1,4 ND	-	190		+	3.3
MW-120B		3.5-4.0			72	· · · · · ·	1			0.70 110				 		100	33000	276		2600	370	19	730	2.3 ND		3.2 ND		630 ND	1.5 ND	22	200	<u> </u>		0.31
GZA-30		7.0-7.5		30.4	123	 		****	0.388 J	2.07			 		 	191	 	874		 		181	 	6.46		0.005 1	 						19 ND	<u> </u>
TL16-09	X	1.0-3.0	570	174	1940	0.52	293	0.015 J	1.8 ND	10	0,0083	14800	3.7 ND	0.01 ND	43	6170	257000	7730	3.1	46 J	54	7.7	538 J			0.905 J	0.040.110	1000 110	0.681 ND			65.8		6
TL17-06	X	3.0-5.0	· 5770	77	922	1	135		0.28 ND	2.7		28600	105	10.01	15	1530	73600	2840	3.1	643 J	226	118	1490	14	0.0061 J	24	0.010 ND		31 ND	1	3820	l		5.6
TL17-07	×	10.0-12.0	1540	21	5180	1	160	· ·	0.082 ND			47700	7.7	 	34	4520	24100	471		475 J	41	6.2 J	453 J	2,5 J		0.36 J 0.51 J	<u> </u>	842 J	30 J	54	377	105	1.4 ND	6.3
TL17-08	X	3.0-5.0	300	205	1730	0.39 ND	400	0.11 ND			0.0023 ND		1.3 ND	0.01 ND		2570	134000	38800	12	36 J	28	2.4 ND			0.0073 J	26	0.010 ND	366 ND	84 J	8.6	84		1.6 ND	0.33
SB-V12	×	6.0-6.5	1710	5.1	432	,	141		0.605	0.303		1630	5,96		2.42	46.3	26300	485		343	+	2.62	2420	3.2		0.994	0.010 ND		13 ND	2 J		2.6 ND	1.3 ND	69
SB-W11	×	8,0-8.5	468	108	2270		29.8		0.562	4.5		387	5.1	<u> </u>	41,9	1720	274000	3200		238		9.44	556	19.6		25.1	+	1460 340	16.7	1	15.5			1.21
SB-W12	Х	9.0-10.0	4250	1.23	349		78,1		0.615	0.308	- 	746	10.8		2.46	82.8	36200	257		1250		5.67	945	2.46		0.615	1	1550	38.7 0.479	32.2	1300	_	····	15.8

Notes:

ND - Not detected at the indicated concentration.

J - Result is less than the quantitation limit but greater than zero.

The concentration given is an approximate value.

TABLE 7 Comparison of All Metals Results Cinder/Ash and Pyrite Cinder-Impacted Soils

Quanta Resources Superfund Site Edgewater, New Jersey

		NJDEP So Crit		USEPA Reg	jion 9 PRGs	¹ NJDEP	Historic Fill	Database	All Sample	s of Cinder/As Intervals (61	sh Containing i)		es with Evid inder-Impac	lence of Pyritets ts (7)
Parameter		Non- Residential	Residential	Industrial	Residential	Minimum	Maximum	Average	Minimum Detected Value	Maximum Detected Value	Geometric Mean	Minimum Detected Value	Maximum Detected Value	Geometric Mean
ALUMINUM (35) :		N/A	N/A	76000	100,000				938	15700	5226	300	5770	. 1145
ANTIMONY (42)		340	14	410	31				1.2	79	2.5	1.23	1135	45.6
ARSENIC (68)		20	20	2	0.39	0.05	1098	13.2	0.002	913	21.5	349	5180	1275
BARIUM (35)		47000	700	67000	5400				15.0	710	94	29.8	400	135
BERYLLIUM (42)		2	2	1900	150	0.01	79.7	1.23	0.10	5.8	0.37	0.56	0.90	0.32
CADMIUM (42)		100	39	450	37	0.02	510	11.1	0.12	12.0	0.50	0.30	10.0	1.3
CALCIUM (35)		N/A	N/A	N/A	N/A				1090	42800	9118	264	47700	3059
CHROMIUM (48)		N/A	N/A	450	210				5.5	84	21.2	5.10	105	6.1
COBALT (35)		N/A	N/A	1900	900				2.0	23.0	7.1	2.42	70	16.8
COPPER (18)		600	600	41000	3100				10.2	295	87	46.30	1720	188
IRON (35)		N/A	N/A	100000	24000				3320	76900	18821	24100	274000	76922
LEAD (66)		600	400	800	400	0.28	10700	574	0.00008	2100	162	257	38800	2065
MAGNESIUM (35)		N/A	N/A	N/A	N/A				192	7350	1843	36	1250	244
MANGANESE (35)		N/A	N/A	20000	1800				21.0	987	146	20.10	226	57
NICKEL (42)		2400	250	20000	1600				5.2	1100	27.3	2.62	118.0	7.1
POTASSIUM (35)	·	N/A	N/A	N/A	N/A				128	1800	564	285	2420	748
SELENIUM (42)		3100	63	5100	390				0.5	28.0	1.6	2.46	302	11.0
SILVER (42)		4100	110	5100	390		,		0.15	2.8	0.52	0.36	26.0	2.9
SODIUM (35)		N/A	N/A	N/A	N/A				327.0	2930	362	340	1550	645
THALLIUM (41)		2	2	68	5				0.25	6.5	0.74	0.48	84	13.4
VANADIUM (35)		7100	370	1000	78				3.5	70.0	25.1	2.0	54.0	10.2
ZINC (42)		1500	1500	100000	24000	2.45	10900	575	25.0	1000	161	15.5	3820	316
CHROMIUM III (16)		N/A	N/A	450	210				6.7	84	. 19.9	7.7	105.0	10.2
HEXAVALENT CHROMIUM	(32)	N/A	N/A	450	210				0.56	9.5	1.2	0.000	0.80	0.71
MERCURY (39)		270	14	310	23			i	0.02	10.0	0.58	0.13	69	2.9

Notes:

Values highlighted in **bold and italics** are at or above residential and/or industrial values for NJDEP Soil Cleanup Criteria or USEPA Region 9 Preliminary Remediation Goals (PRGs) For samples where constituents were not detected (ND), 1/2 of the detection limit was used for calculations

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm)

Numbers in parentheses () indicate the total number of samples for each analyte or category.

N/A: Not Available

^{1:} Values taken from Appendix D of the N.J.A.C 7:26E (Technical Requirements for Site Remediation; New Jersey Administrative Code, 2005).

^{2:} These samples include those that were taken from discrete intervals of reddish-purple, or dusky red discolored soils.

TABLE 8

Statistical Comparison of Cinder/Ash Soils and Pyrite Cinder-Impacted Soils

Quanta Resources Superfund Site Edgewater, New Jersey

			Shapiro-Wilks T	est for Normality a		E	quality of Variance	a,b			Backgroui	nd Comparison a,c	THE STATE OF THE STATE OF
Inorganic	Туре	Untransformed Data Normal?	p-value	Log-transformed Data Normal?	p-value	Equal Variance?	F Value	p-value	Mann-Whitney Statistic	p-value	t Value	p-value	Significantly Different?
Aluminum	Cinder/Ash	No	0.01481186	No	0.01299926				25	0.00004040			V
	Pyrite Cinder Impacted	Yes	0.0935318	Yes	0.55600865				25	0.00261048			Yes; Cinder/Ash greate
Antimony	Cinder/Ash	No	2.0264E-08	No	0.01732947				40	0.00536629			V 5 "
	Pyrite Cinder Impacted	No	0.00055339	Yes	0.90920939				40	0.00536629			Yes; Pyrite Impacts grea
Arsenic	Cinder/Ash	No	4.7391E-14	No	3.4229E-07				4	2.3642E-05	e de la maria		Voc. Durita tananta anno
	Pyrite Cinder Impacted	Yes	0.09750767	Yes	0.71528767				7	2.3642E-05			Yes; Pyrite Impacts grea
Barium	Cinder/Ash	No	9.54E-07	Yes	0.81170957	Yes	1.17401975	0.91601001			-0.95631389	0.34586748	Ma
	Pyrite Cinder Impacted	Yes	0.42704108	Yes	0.72923378	100		0.01001001			-0.93031309	0.54566746	No
Beryllium	Cinder/Ash	No	4.968E-10	Yes	0.29071036	Yes	1.65325319	0.55099636			0.9227346	0.36167819	Ne
	Pyrite Cinder Impacted	Yes	0.71115534	Yes	0.11887512	100	1.00020010	0.00000000			0.9227340	0.50107619	No
Calcium	Cinder/Ash	No	6.3296E-05	Yes	0.63088176	No	6.11314267	0.00076897	74	0.32230711			No
	Pyrite Cinder Impacted	No	0.02835286	Yes	0.2731844			0.000,000,		0.02200711			INO
Cadmium	Cinder/Ash	No	2.3269E-10	Yes	0.08260478	Yes	1.2956213	0.57121125			-1.94936689	0.05828742	No
	Pyrite Cinder Impacted	No	0.02037955	Yes	0.53090292				经过全国的办		1,0400000	0.00020742	140
Chromium	Cinder/Ash	No	0.00014659	Yes	0.87964932	No	5.74237916	0.00044318	50	0.0063127			Yes; Cinder/Ash greate
	Pyrite Cinder Impacted	No	5.2357E-05	Yes	0.69640167					0.0000121			res, officer/Astrigreate
Chromium III	Cinder/Ash Purity Cinder Impacted	No	0.00169266	Yes	0.11869738	No	7.03008042	0.0190658	14	0.45934179			No
	Pyrite Cinder Impacted Cinder/Ash	Yes	0.10522104	Yes	0.7914572	e Basile Hall	Maria Salara						.,,
Cobalt	Pyrite Cinder Impacted	No Yes	0.00212548	Yes	0.66749381	No	5.38937298	0.00181042	56	0.08327414			No
	Cinder/Ash	No	0.48922026	Yes	0.07195313								110
Copper	Pyrite Cinder Impacted	Yes	0.0058937 0.4143945	No	0.04815368				48	0.0119293			Yes; Pyrite Impacts grea
	Cinder/Ash	No	0.4143945	Yes No	0.08274199 2.2518E-11								J J
Iron	Pyrite Cinder Impacted	Yes	0.06600032	Yes	0.25590905				26	0.00298768			Yes; Pyrite Impacts grea
	Cinder/Ash	No	1.8071E-08	No									June uniferente Susa
Lead	Pyrite Cinder Impacted	No	0.00030582	Yes	1.8824E-11				60	0.00228408			Yes; Pyrite Impacts grea
	Cinder/Ash	No	3.8865E-08	Yes	0.57914884								y and your map go as
Mercury	Pyrite Cinder Impacted	No	0.00062286	Yes	0.65808893	Yes	2.08409795	0.16383611			-2.20086423	0.03373246	Yes; Pyrite Impacts grea
	Cinder/Ash	Yes	0.08255504	Yes	0.50665026								71.2.1.1.1.2.3.2.3
Potassium	Pyrite Cinder Impacted	Yes	0.0904691	Yes	0.78748677	Yes	1.34764127	0.54210572			-1.02116378	0.31460506	No
	Cinder/Ash	No	2.9153E-06	Yes	0.27120191								
Manganese	Pyrite Cinder Impacted	No	0.0287512	Yes	0.84458885	Yes	1.02642049	1			2.68519792	0.01125323	Yes; Cinder/Ash greate
	Cinder/Ash	No	0.00155581	No	0.04808964			CASTON CASTON CA					
Magnesium	Pyrite Cinder Impacted	Yes	0.24195239	Yes	0.39277178				17	0.00083758			Yes; Cinder/Ash greate
	Cinder/Ash	No	7.8317E-12	No	0.00207739								
Nickel	Pyrite Cinder Impacted	No	2.7593E-05	Yes	0.2584965				41	0.00595156			Yes; Cinder/Ash greate
	Cinder/Ash	No	4.4144E-06	Yes	0.98473659								
Sodium	Pyrite Cinder Impacted	Yes	0.37842966	Yes	0.68010482	Yes	1.46586137	0.66926035			-1.51738706	0.13869152	No
	Cinder/Ash	No	1.8354E-10	Yes	0.07173901				MINISTER OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF T				
Selenium	Pyrite Cinder Impacted	No	1.9699E-05	Yes	0.11295668	No	3.31166947	0.02247839	26.5	0.00119653			Yes; Pyrite Impacts grea
0.1	Cinder/Ash	No	0.00452152	No	0.0022412		ASSESSMENT OF THE PARTY OF THE						
Silver	Pyrite Cinder Impacted	No	0.00349502	No	0.01869401				81	0.16133629			No
The Wisses	Cinder/Ash	No	7.0795E-09	No	0.00056666								
Thallium	Pyrite Cinder Impacted	Yes	0.14272546	Yes	0.23549889				27.5	0.00152432			Yes; Pyrite Impacts grea
Vanadi	Cinder/Ash	Yes	0.33752499	Yes	0.08930724	THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COL		NUMBER OF STREET	STEER SERVICE	B 100 30 100	STATE OF THE PARTY		
Vanadium	Pyrite Cinder Impacted	No	0.02516506	Yes	0.85261184	Yes	2.67004311	0.07279624			2.74102017	0.00981074	Yes; Cinder/Ash greate
Zing	Cinder/Ash	No	1.3483E-05	Yes	0.38075098								
Zinc	Pyrite Cinder Impacted	Yes	0.0512526	Yes	0.6777497	No	4.55601188	0.00343315	94	0.33612016			No

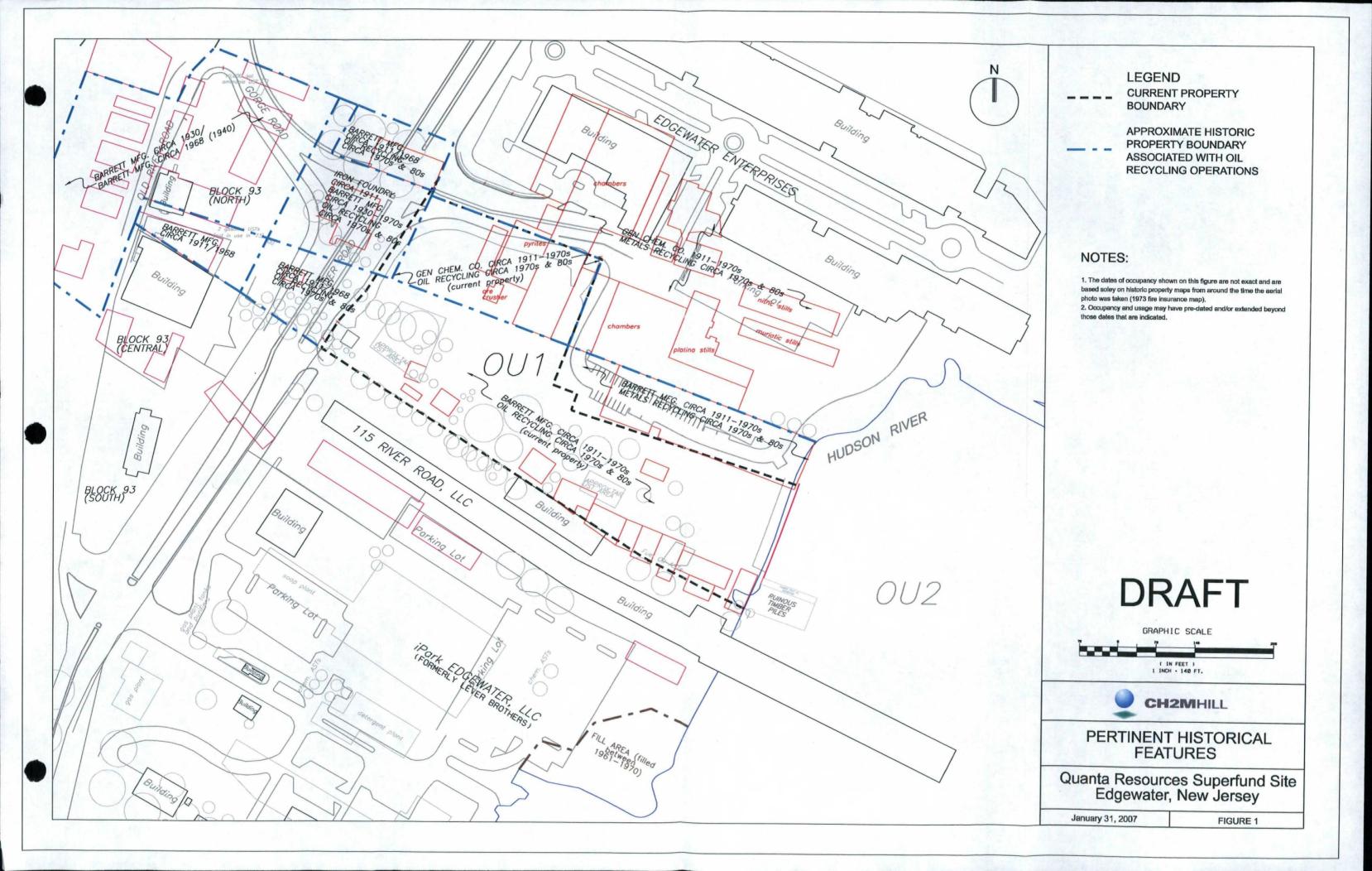
Non-detects were included at 1/2 the detection limit

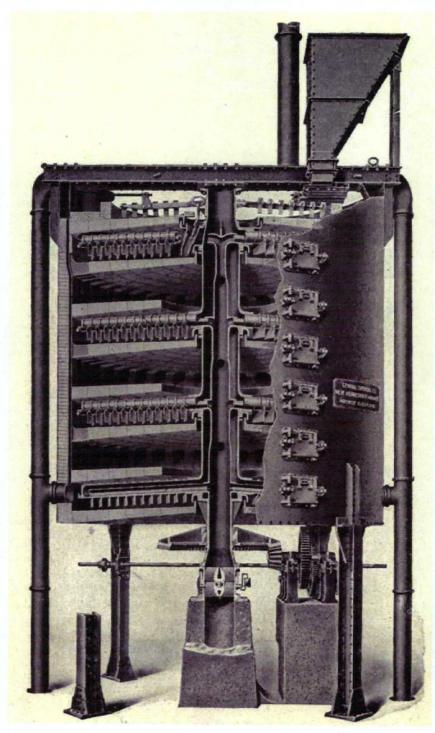
= Data (untransformed or transformed) used for comparions; data with closest approximation to normal distribution and greatest equality of variance (based on p-values) selected; Untransformed data used for non-parametric tests. = Test not performed

 $^{^{\}rm a}$ p-values were considered significant at p \leq 0.05

^b An equality of variance test was performed only if both data sets had normal distributions

^c A t-test comparison was made only if both data sets were normal and had equal variances, otherwise a non-parametric Mann-Whitney rank-sum test was performed





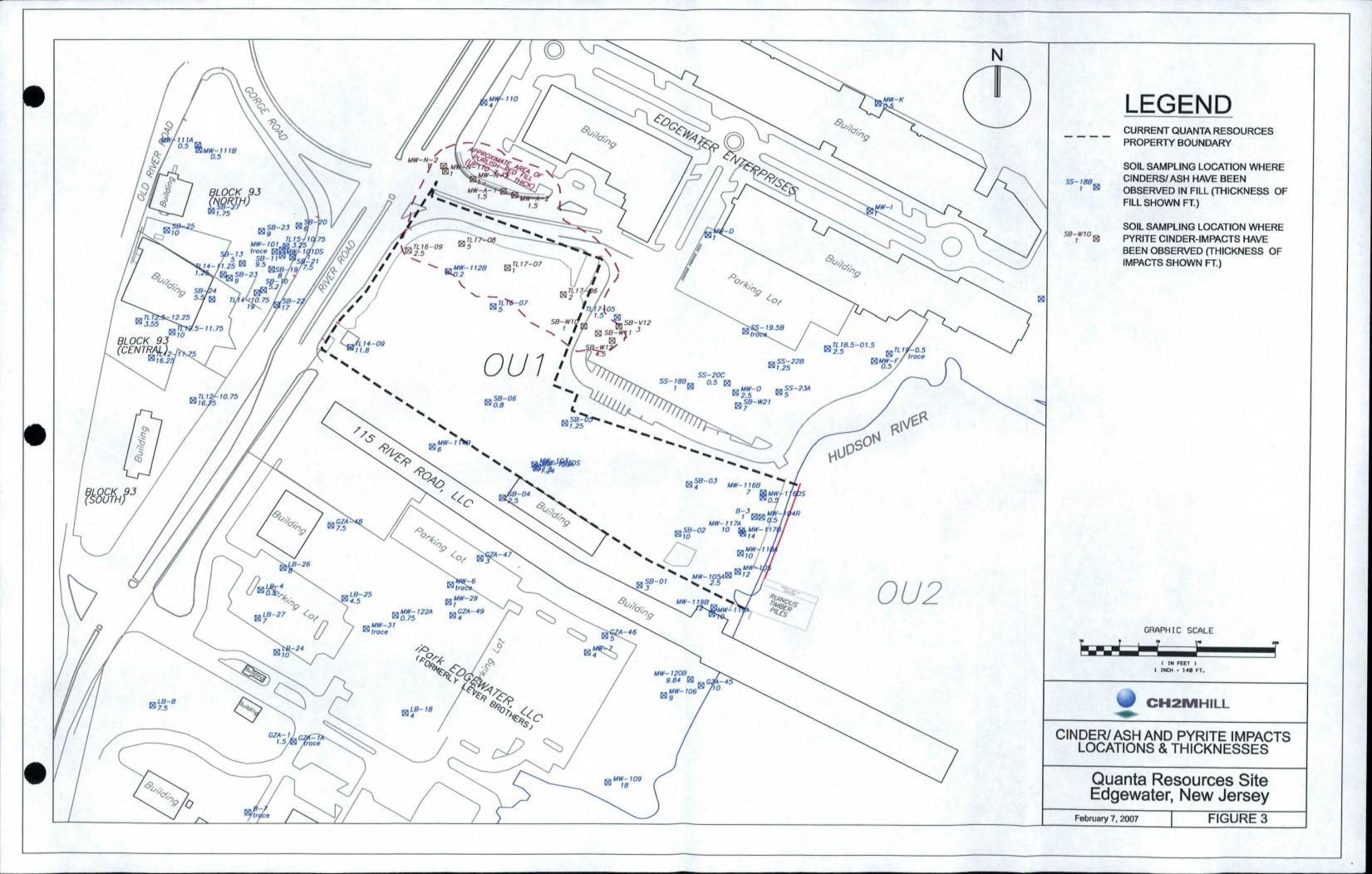
HERRESHOFF BURNER



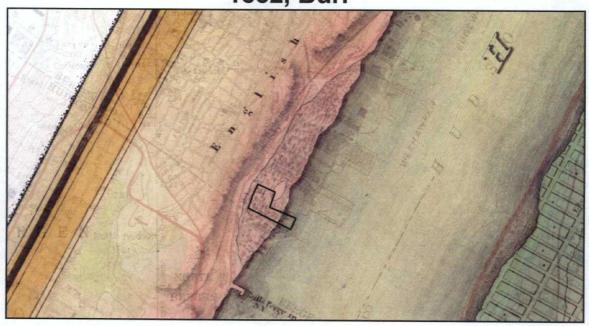
Typical Herreshoff Fine
Pyrite Ore Burner
Quanta Resources Superfund Site
Edgewater, New Jersey

2/6/2007

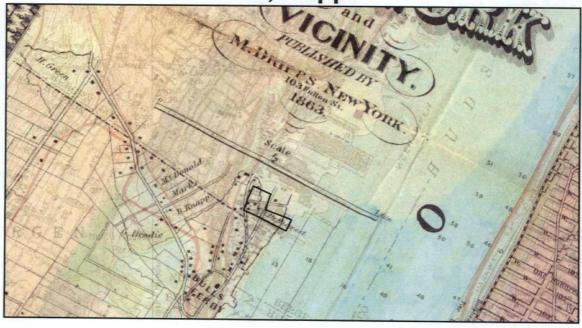
FIGURE 2



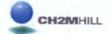
1832, Burr



1863, Dripps



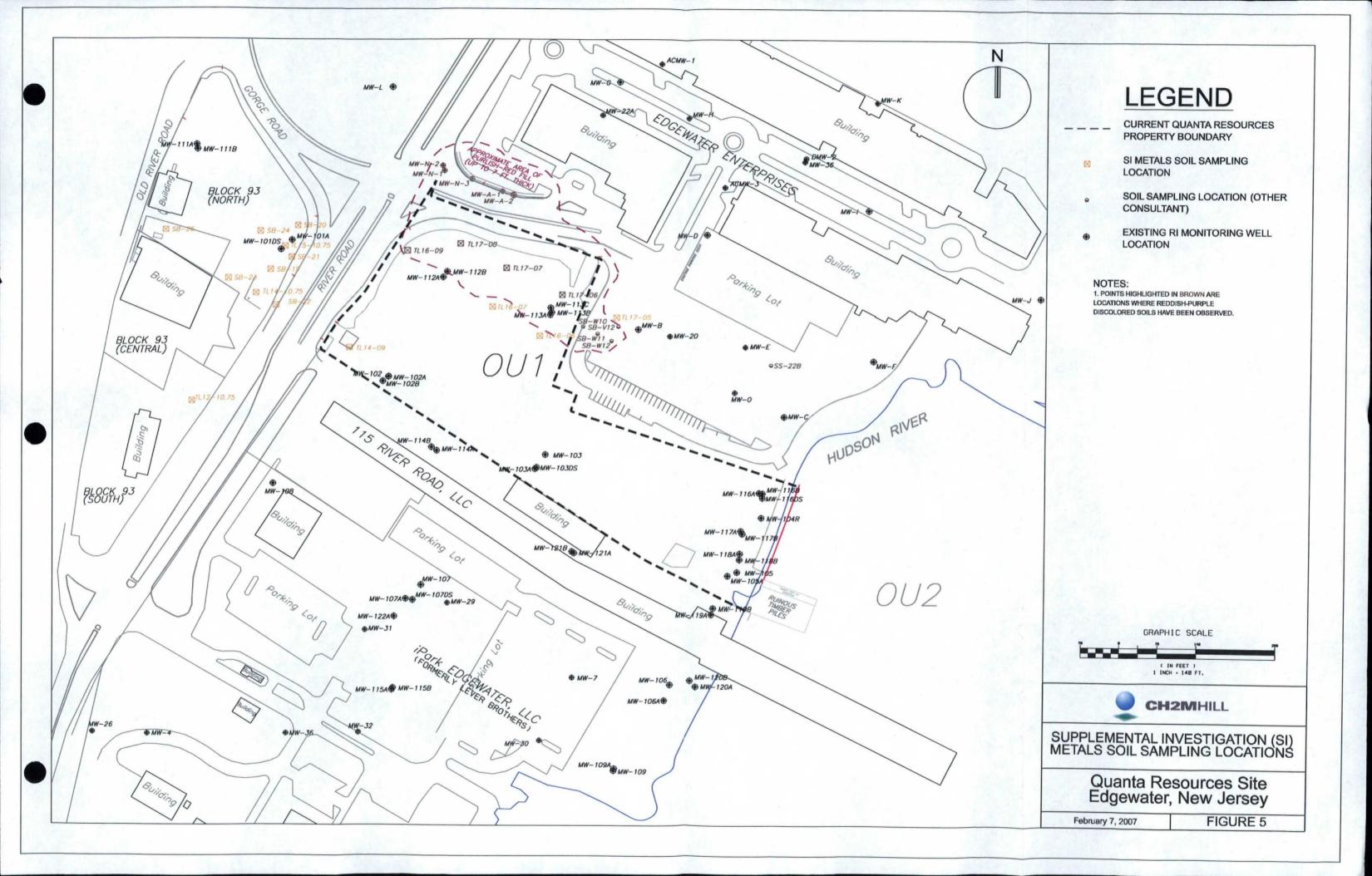
Map Sources: http://www.davidrumsey.com/ USGS, New York, New York 7.5 Min Quad, 1992

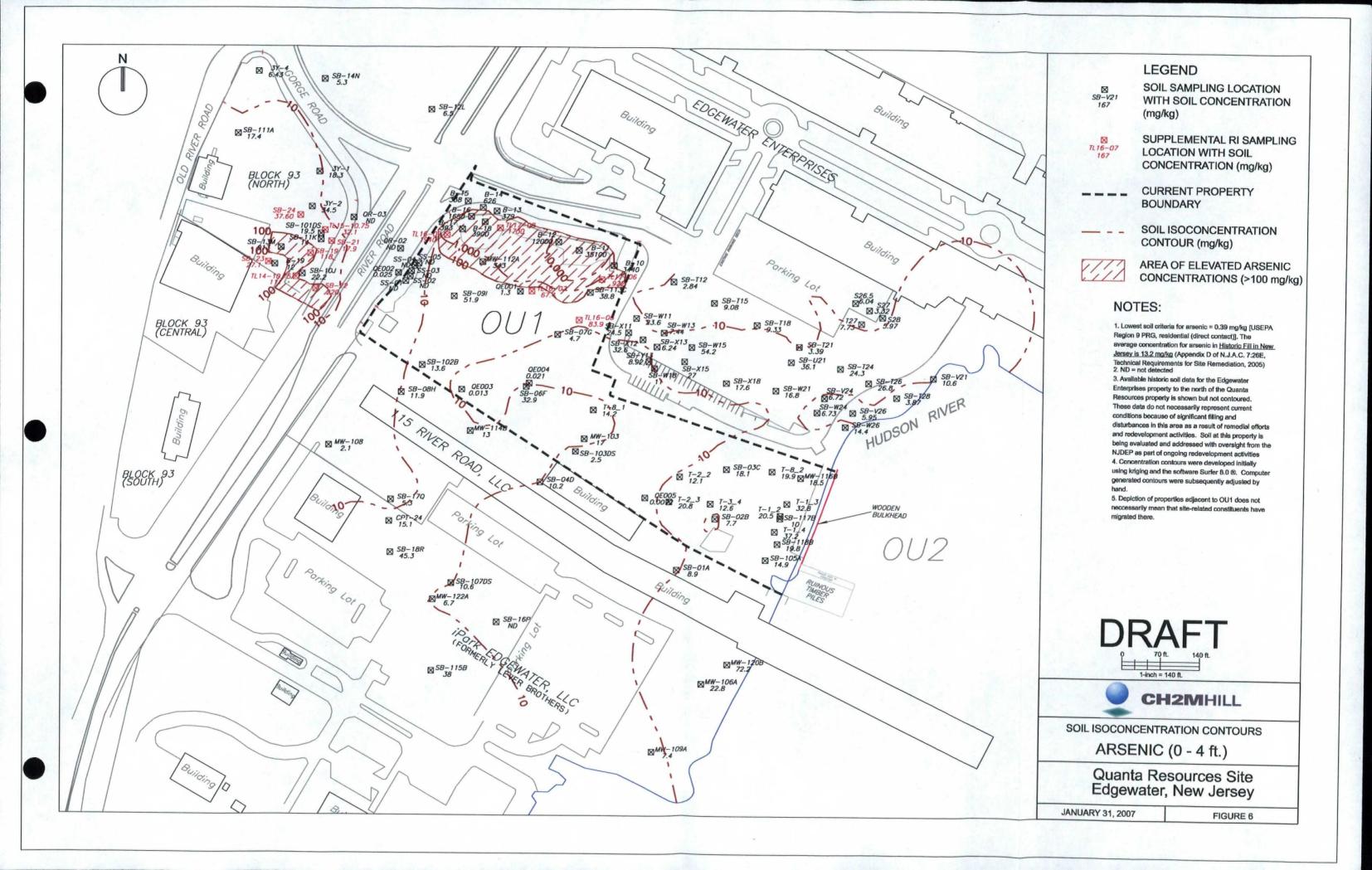


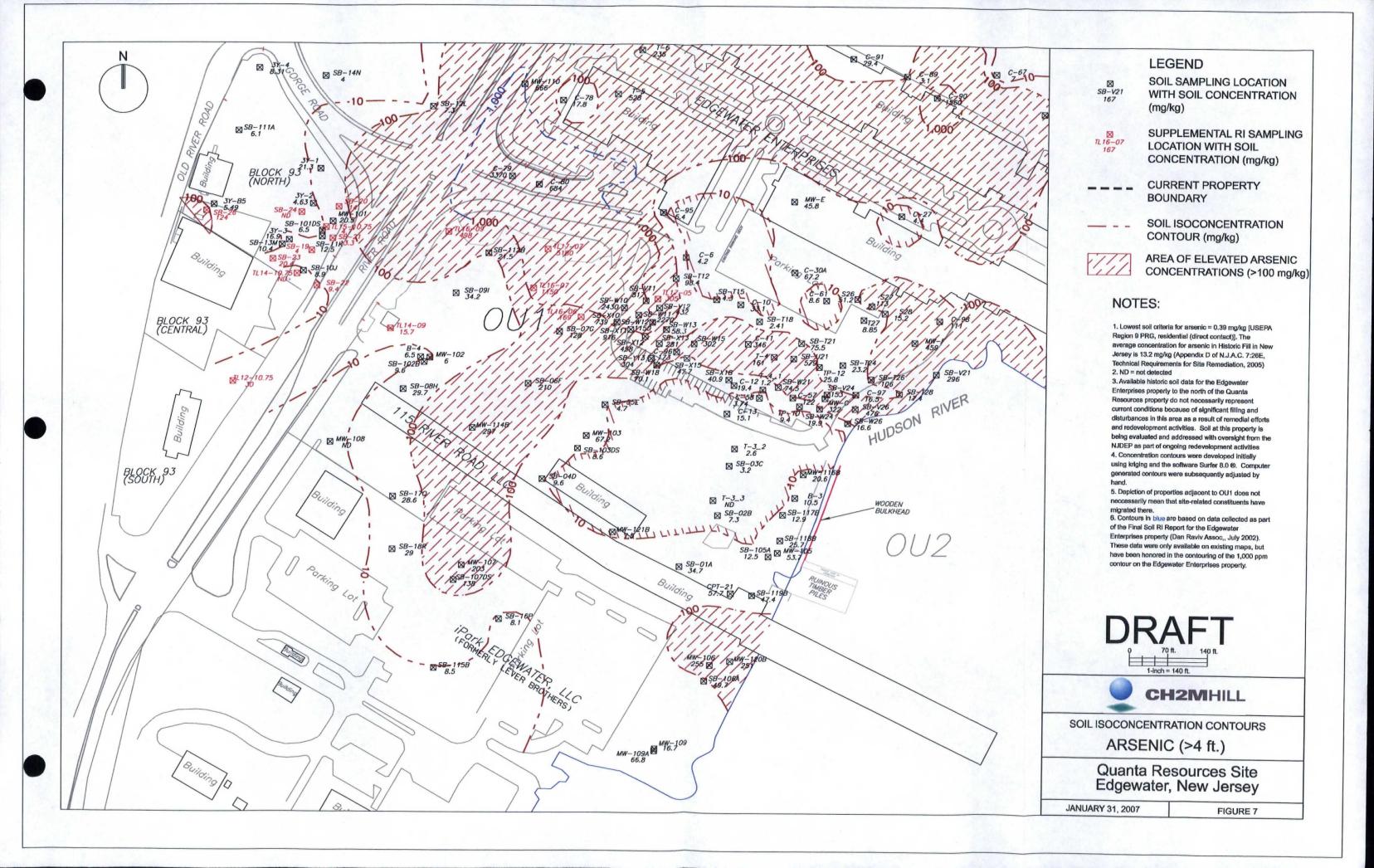
Historical Maps and
Wetland Filling
Quanta Resources Superfund Site
Edgewater, New Jersey

2/6/2007

FIGURE 4









94					Ļ.,,,,						·					
PROJECT NAI			Quanta			3:				SURFACE ELEVATION	l: 6:5 f	t. ams	il		· · · · · · · · · · · · · · · · · · ·	
LOCATION:					3				!	MEASURING POINT:	N/A	·			· · ·	
PROJECT NU						- 	7			MEASURING POINT E	The strategies and all all		/A-			
CLIENT:			loneyw	·····						TOTAL DEPTH:				· · · · · · · · · · · · · · · · · · ·		
										FOREMÁN:						
										DRILLING EQUIPMEN						
SAMPLING M	ETHOD	<u>. 5</u>	ft. ma	crocor	e sai	npler	-:: -			CH2M OBSERVER:	A Harc	lerode)		<u> </u>	
START DATE:	·	.1	0/12/20	006		······································			<u> </u>	FINISH DATE:	10/12/2	2006		,	· · · · · · ·	
NORTHING:	7189	68.	76		EAS	1 11 202 Trans	15		6	APPROX. DEPTH TO V	VATER: 2	ft. bgs	s 10/12	2/06		
,			(ES				ENING TA		M	ATERIALS DESCRIPTION	ÓŇ		ğ	WELL	CONSTRU	ICTION
DEPTH (FT BGS) SÄMPLE OR RUN DESIGNATION	ENTER DESCRIPTION OF THE PROPERTY OF THE PROPE	OWNILE LIKE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	пор	QJa	QI	ELEVATION (ft. MSL)	BOCK: rock ty	y color, classification, moi dan, grain size, and other, pe, color, hardness; major weathering, and degree of	descriptors mineral	GRAPHICALLOG	USCS GROUP SYMBOL			
_0	3.0)	N/A	3;5/5	NA	4.8	:N/A	5	Intermixed sand cinder/slag, mo (FILL)	dy gravel, crushed brick, as ist to saturated, medium do	nd ense	\O\ \O\ \\		0.		: ;
(SB-19-	6.0'			'69'' '%		57	.N/A		Same as above	but with some solid, plast heen, and obvious coal tar	ic tar, odor		K 14 C 14 C 14 C 14 C 14 C 14 C 14 C 14	3-		
	5.0)	5	N/A	3.5/5	₩A	32	(N/A	- - -	semi-solid black	with fine, sub-rounded grak k product in pore space, we 5 of solid, plastic tar @ -	at danna			5- 6- 7- 8-)
- 10		1		A ALEGA	i L	30	N/A	F	Clayey peat, da (CLAYEY PEA	rk brown, 7.5YR, 3/3, mois T)	st, very soft		CUPT	9-		- (
			N/A	1,5/5	NVA	3.1	NVA	5	Sandy peat, dai loose (SANDY I	rk grey, 10YR; 4/1, mojsts PEAT)	aturated.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	SPIPT			
÷15)	N/A	5/5	NA	ŅĎ	NA		Fine sand, well- saturated, very	sorted, dark grey, 10YB,4/ loose, running sand (FINE	t, SAND)		SP	15 - 16 - 17 - 18 -		
- 20) () ()	,	ŇΑ	4.5/5	NA	ND	'N/A	15	Clayey sand/sar saturated, soft (ndy clay, brown, 7.5YR, 4/2 CLAYEY SAND)	2,		SC/CL	20= 21 - 22 -		
						ND	N/A	-	Silty clay, brown moderate plastic	ı, 7.5YR, 4/2, moist, stiff, lo lity (SILTY CLAY)	w to:		CL:	23 – 24 –		
25 -								_ 1	Bottom of boring	@ 25.0 ft. bgs				25 - 26 -		1
 - - 30.														27.— 28.— 29.— 30.—		
LEGEND: msl = mean sea bgs = below gn surface ND = not detect NM = not meas N/A = not applie	ound ted ured	S	AMPLE D. drive W: wash T: Shell A: Auge A: Auge IA: hand C: core	ned by Tub er Lauger d	e ore	OIL: GI MOISTU dry moist wet PROPOR	RE: TIONS	0-4: N 5-10: 11-29 30-49 50+: S:	very loose loose loose loose loose loose loose loose very dense Density de counts for	0-2 very soft	NOTES: SB - 19 (1 - 3); SB - 19 (4 - 6); ROCK: ROCK: ROD (rock qu	VOCs	, SVOC	s, Select TAI	L Metals	

CH2MH	LL

<u> </u>											
PROJECT NAME	ROJECT NAME: Quanta Resources SURFACE ELEVATION: 9.0 ft. amsl										
LOCATION:		Block 9	3, Lot	3 .				MEASURING POINT: N/A			
PROJECT NUME	BER: _	332898	<u> </u>					MEASURING POINT ELEVATION: N/A			
CLIENT:		Honeyv	vell					TOTAL DEPTH: 30 ft bgs			
DRILLING CONT	RACT	OR: S	GS En	viron	mental :			c. FOREMAN: J Rousa			
DRILLING METH	IOD:	Direct F	Push					DRILLING EQUIPMENT: Geoprobe 6610 DT			
	CH2M OBSERVER: A Harclerode										
START DATE:	FINISH DATE: 10/12/2006										
								7 APPROX. DEPTH TO WATER: 7.5 bgs 10/12/06			
MORTAING	7,100			. EAG	MINING.			AFFROX. DEFIN TO WATER. 100 SIGN TOWNERO			
	T	s 🗊	:		SCREE			MATERIALS DESCRIPTION & WELL CONSTRUCTION			
		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	Ê		DÃ	TA.	[35]	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors.			
DEPTH (FT. BGS) SAMPLE OR RUN DESIGNATION	'n	2 E	RECOVERY/ PENETRATION (FT.)	j.			ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. BOCK: rock type, color, hardness, major mineral types, weathering; and degree of fracturing			
F) R) Sign	SAMPLETYPE	E E E	¥AT!				Į Ž	SOILS density, color, classification, moisture, secondary grain size, and other descriptors.			
F B B B B B B B B B B B B B B B B B B B	립	WS.				i .	VAT	ROCK rock type, color, hardness, major mineral			
DEPTH SAMPLE RUN DE	SAN	PLO o	ÄË	8	Ola	윤		ROCK rock type, color, hardness, major mineral types, weathering, and degree of fracturing g			
				İ							
_0		<u> </u>		<u></u>			Ŀ	0			
<u>.</u>	D	NA	4,5/5	WA.	20.8	N/A	_	Intermixed black cinder/slag, red brick, white concrete, some course angular gravel/fractured			
			ŀ				ŀ	rock, dry to moist, dense (FILL)			
<u>.</u> .		-				ŀ	-	3			
11		<u>}</u>				,	-5	4			
5.0' to 7.0'	. D	NVA	3.75/5	NA	5.3	N/A:	Ī	Intermixed clayey sand, cinder/slag and solid plastic- coal tar; black, dry, medium dense (FILL)			
(SB-20-6.0))	<u> </u>		ľ	0.1	N/A;	[Medium sand, some clayey sand/native, dark grey.			
<u>.</u> ,	-	ľ				ľ	<u> </u>	10YR, 3/1 and brown 7.5YR, 4/2, saturated, loose (SAND) 8			
<u>.</u> .	-					: :	-0	9-			
-10	Ŀ	<u> </u>	5.00		110	A STATE OF	ŀ.	10-			
<u></u>	D:	.N/A	5/5	NA	ND	N/A	•	Fine to medium well sorted sand, dark grey, 10YR, 3/1, saturated, loose (SAND)			
-			:		ļ.		ŀ	12 -			
					,		5	13 14			
15								15			
- 15	Đ	N/A	3.5/5	WA	ND	N/A	<u> -</u>	Same as above but well graded sand (clayey sand to coarse sand) (SAND)			
<u>-</u> .	ŀ					ļ. -	ŀ	17-			
- .				;			F	18-			
19.0° to 20.0	_			:			-10	19-			
20 (SB-20-19.5) D	N/A	2.5/5	NΑ	ND	NΑ		Same as above but running sand (SAND)			
	ŀ	1		ľ	ŀ		L.	22-			
							ļ.	23 -			
<u> </u>						ļ	15	24-			
25	D	NA	5/5	NA	ND	NA	-	Interbedded clayey sand and silty clay, dark grey, 5C/CL 25-			
-	١	1940		1.57.	1,12	1.54	<u> </u>	10YR, 4/1, moist to saturated, soft/loose (CLAYEY			
-		ľ					Ī.	SAND/SILTY CLAY)			
	ŀ	1		٠.	ND	NA	20	Discretion destroyers 40VD 4/4 moint modified Fig. C			
- 30		ļ	<u> </u>	ļ				(SILTY CLAY)			
L **	l:						F	Bottom of boring @ 30 ft. bgs			
	ľ] .								
LECEND		SAMPL	E TYPI	ES:	SOIL	RANII	LARSO	OILS DENSITY: PLASTIC SOILS DENSITY: NOTES:			
LEGEND: msl = mean seal	evel	D: drh W: wa	/e	- TA	MOIOI	URE:		OÜLS DENSITY: PLASTIC SOILS DENSITY: Very loose 0-2: very soft SB-20 (5-7); Select TAL Metals SB-20 (19-20); Select TAL Metals			
bgs = below grou		ST: She	elby Tu	be	dry moist		11-2	9: medium dense 5-8; medium soft 19: dense 9:15: stiff			
ND = not detecte NM = not measur		A: Au HA: ha	nd aug	er	wet		50+	: very dense 16-30; very stiff ROCK:			
N/A = not applica		C: cor RC: rot		core	PROPO Trace:	<5% F	ew: 16	Density designation based on blow reported in % = [length of core in pieces 4"]			
i				1	I HHIO E	150C	nmo- n	11.40% utiling a 140 h hammer w/30" dron and longer/ length of runl x100			

		1.	į
	CH2MH	IILI	
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L	·			ļ				
PROJECT NAME					<u>. </u>		· · · · · · · · · · · · · · · · · · ·	SURFACE ELEVATION: 11:3 ft. amsl
LOCATION:								MEASURING POINT: N/A
			3					MEASURING POINT ELEVATION: N/A
CLIENT:		Honeyv						TOTAL DEPTH: 25 ft. bg
DRILLING CONTI	RACT	OR: S	GS En	viron	mental	Servic	es, In	c. FOREMAN: J Rousa
DRILLING METH	D: _	Direct F	Push					DRILLING EQUIPMENT: Geoprobe 6010
SAMPLING METH	IOD:	5 ft. ma	crocor	e sar	npler	·		CH2M OBSERVER: A Harclerode
START DATE:	<u></u>	10/13/2	006					FINISH DATE: 10/13/2006
NORTHING:	1899	1.19	18.1	EAS	TING:	632	786.9	6 APPROX. DEPTH TO WATER: 4.5 ft. bgs: 10/13/06
		,g; ⊋		ľ	SCREE		ı	MATERIALS DESCRIPTION 6 WELL CONSTRUCTIO
DEPTH (FT. BGS) SAMPLE OR HUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	Rop	DA:	- E	ELEVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types; weathering, and degree of fracturing
, 0 ;			4.5/5	N/A:	. ND,∴	N/A		0
1,0'10'3,0',	7	1 112.00			40	NVA	10	Organic silt, dark brown, 7.5YR, 3/3/moist, loose
- (\$B-21-2.0)					•		-	Intermixed silt, gravel, cinder/slag, crushed brick, black and red, dry to saturated with depth, medium dense, solid, plastic tar @ approx. 2.2 to 2.5 ft. bgs (FiLL)
5 5.0 to 7.0 (SB-21:6.0)	Ď	NA	3:5/5	NA.	4.7	N/A	5 5	Same as above with obvious product odor, bottom, 0.5' (approx. 9.0 to 9.5 ft. bgs) is solid, dense, brittle tar (FILL)
-10) NOSETT		0.2	N/A	-	Clayey peat/native, dark brown, 7.5YR, 3/3, moist, soft (CLAYEY PEAT)
	D	NA .	2.5/5	, NA	ND	N/A	0	Fine, very well sorted sand, brown, 7.5YR, 4/2, saturated, loose, running sand (SAND) SP 11 12 13 13
15 	Ď	NVA	3/5	N/A	ND	· N/A	- 	Same as above (SAND) 14- 15- 16- 17- 18-
20	1		.04 (27.5)				_	19,4
- -	D.	N/A	5/5	:NVA	ND	·N/A	ió 	Same as above but slightly coarser; medium sand (SAND) 21 - 22 - 23 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -
– 25	-				ND	N/A	_	CL /25
- 1							15	Bottom of boring: @ 25 ft. bgs
-		ļ,.				-	-	27-
					.	•	-	28 -
— 30							-	
LEGEND: msl = mean sea let bgs = below groun surface ND = not detected NM = not measure N/A = not applicab	d I	SAMPL D. driv W: was ST: She A: Aug HA: han C: core RC: rota	e hed lby Tub or d auge ed	r r core 1	OIL: GF MOISTU dry moist wet PROPOR race: <	RE: ITIONS 5% Fe	0-4: v 5-10: 11-29 30-49 50+: 3: w: 16-	

CH2MHILL	_
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					<u></u>									
PROJ	ECT NAME:		Quanta	Reso	urces				SURFACE ELEVATION:	10.2 f	t. ams	<u> </u>		
LOCA	TION:		Block 9	3, Lot	3				MEASURING POINT:	N/A				
PROJ	ECT NUMBER	B:	332898	B. <u>.</u>					MEASURING POINT ELEVA	ATION:	N/A	Α		
	IT:		Honeyw						TOTAL DEPTH: 25 f					
		VCT.	op. Si	GS En					FOREMAN:J					
	ING METHOI								DRILLING EQUIPMENT:					
					o par				CH2M OBSERVER:					
					B:541	npiei.								
	T DATE:		•						FINISH DATE:1					
NORT	HING:71	890	4:06		EAS	STING:	632	:739.3	APPROX. DEPTH TO WATE	R: 8f	t. bgs	10/13	/06	
			S. ft.)			SCREE	140	Į.	MATERIALS DESCRIPTION			ō	WELL CONSTRUCT	IOI
	Š		BLÓWS PER 6 INCHES or CORE RUN (time/it.)	E)		DA [*]	IA [ELEVATION (II. MSL.)			en.	SYMBOL		
оертн (FT. 8GS)	SAMPLE OR RUN DESIGNATION	Щ.	2 2	_ 8				(F.		- 1	GRAPHICAL LOG	S d		
E	ଳ ବ୍ର	SAMPLE TYPE	PER	RECOVERY/ PENETRATION				NO.	SOILS: density, color, classification, moisture, secondary grain size, and other descriptions.	ptors.	CAL	GROUP?		
ᆂ	<u> </u>	ם	WS	ŠĒ			2	VAT	ROCK: rock type; color, hardness, major miner		AP.	က္က	ľ	
H	MAN.	SAN	BLO	黑節	DG.	<u>G</u>	FID	ELE	types, weathering, and degree of fractu	iring	R)	uscs		
				 					<u> A</u>			<u> </u>		2 42
o								10					ģ <u>.</u>	
-: -:	· ·	D	N/A	3.5/5	NA	ND.	N/A		Organic silt, dark brown, 7.5YR, 3/3, molst, loos	se .			.,,,	
	1:0' to 3.0' (SB-22-2.0)		ļ. ,			ND	NA/	Ŀ	<u> </u>	<i>∕\</i> }	Số'		2-	
<u>.</u>	**	1				ND.	, N/A(Ļ	Rulverized concrete (FILL)	/	02/	į,	3-	-
-				ľ	ĺ		·	7:	Intermixed silt, crushed brick, cinder/slag, dark brown, 7.5YR, 3/3 and black, dry, dense (FILL)			•	4-	
- 5		D.	N/A	3.5/5	ΝΆ	ND	N/A	5	Gravelly silt, dark brown, 7:5YB, 3/3, dry, loose	⁴	ŠÖ.	į	5-	
-						ND.	N/A	t.	(FILL)	<i>_</i>	O_{λ}^{λ}		67	
-						5.4	N/A	1	Pulverized concrete (FILL)	/ <u>/</u>			/-	
_ _		ľ			ŀ	Server e			Same as 5.0 to 6.0 ft. bgs above but saturated		<u>0</u> 0	•	9-	
10		ļ.,		38772		76.2	, N/A	_0	(FILL)	^	$\mathcal{O}_{\mathcal{A}}$		10-	
-		D	NA	4,2/5	·N/A	4.7	N/A	_	Gravelly cinder/slag, some wood, black, saturate	ed,	004	,	93E-	
-		ì						ļ.,	medium dense, obvious product odor (FILL)				12 -	
~					<u> </u>	68	N/A	-	Same as above with some geo-fabric-like mater		So.		13-	
 						240	- N/A	-	Solid, semi-plastic tar, black, moist, very dense		00/		15-	
— 15 -	15.0 to 17.0 (SB-22-16.0)	Ď.	NA	2.5/5	.N/A	40	NA NA	-5	Same as 10 to 12.25 ft. above but with viscous to product and obvious product odor (FILL)	black /			16-	
_	(35-22-10.0)	-		ļ			102	_	Crushed cinder/slag, black, dry, loosé (FILL)		Š		17-	
-			ŀ			40	NA	-					18-	
_		١.				10.	19,71	-	Same as above but with highly viscous black product in pore space with solld, plastic tar (FILL	L)	OS/A]	19	
20		D	NA	3.75/5	NA	10.	N/A	10	Clayey peat/native, dark brown, 7.5YR, 3/3, moi	ist,		CL/PT	20	
_								r .	very soft (CLAYEY PEAT)	-	7-7		21 - 22 -	
			ŀ	1				Ĺ		}	7-7		23	
-								Ĺ			-7		24 -	
- 25		<u> </u>	ļ	-	<u> </u>			-15	Bottom of boring @ 25 ft. bgs		=>=		25	
-								-			.[26	
F								F .		l			27-	
-				1				-			-		28	
r								-					29-	
30					١.					1		Ì	30 -1.	
			<u> </u>	<u> </u>	L,	<u> </u>	L	<u></u>	· · · · · · · · · · · · · · · · · · ·	TEC				_
	END:	.1	SAMPL D: driv		ES:	SOIL: G		LAR SO 0-4:	very loose 0-2: very soft SB-			svoc	s, PCBs, Select TAL Metals,	
	mean sea leve below ground		W: was	shed	be	dry moist	,nE.	5-10	loose 3-4: soft Hex. 3: medium dense 5-8: medium soft SB-2		7): VO	s, SVC	DCs, PCBs, Select TAL Metal	s,
	surface not detected		A: Au	ger		wet		30-4	9: dense 9-15: stiff Hex. (Chromiui CK:	m			-
	not measured not applicable		HA: har	ed	- 1	PROPO	RTION	IS:	> 30: hard Density designation based on blow	(rock qu	ality de	signation	on): ore in pieces 4"	-
	••		RC: rot	asonic	core	Trace: 4 Little: 6			out of the country of	longer/ le				

	CH2MHIL	L

					1								
PROJE	CT NAME:		Quanta	Reso	urces	š			SURFACE ELEVATION: 5.5	ft. ams	i		
	ION:		Block 9						MEASURING POINT: N/F	·· ·		· · · · · · · · · · · · · · · · · · ·	
PROJE	CT NUMBE	Ř: ;	332898	3					MEASURING POINT ELEVATIO	N: _N	/A-		
CLIEN	Ť:		Honeyv	vell					TOTAL DEPTH: 20 ft.				
RILLI	NG CONTRA	CT	OR: S	GS En	viron	mental	Service	es, În	E. FOREMAN: J ROL	ısa		- 12 4 1	
ÖRILLI	NG METHO	D:	Direct F	Push.		•			DRILLING EQUIPMENT: Geop	robe 60	10		
SAMPI	ING METHO	D:	5 ft. ma	crocor	e sa	npler			CH2M OBSERVER: A Hai	clerode			
START	DATE:		10/18/2	006	· · ···		`	· · · · · ·	FINISH DATE: 10/18	/2006	···		
NORT	HING:71	895	2.69		EAS	STING:	632	2659.2	APPROX: DEPTH TO WATER:	4.75 ft.	bgs 10	0/13/06	
			ω 😭		Г	SCRE	ÉNING		MATERIALS DESCRIPTION	T	پر	WELL CON	STRUCTIC
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	í da Ga	ATA E	ELEVATION (#. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. ROCK: rock type, color, hardness, major mineral, types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS, GROUP SYMBOL		
_0												0	
3	0 to 2.0' (SB- 23-1:0) 2.0' to 4.0' (SB-23-3.0)	a	N/A	4/5	N/A	12,2	N/A:	5 	Intermixed silt, gravel, cinder/slag, dark brown, 7.5YR, 2.5/2 and black, dry to saturated with depth, dense, solid, semi-plastic tar. @ approx. 4.0 to 5.0 ft. bgs with some geo-fabric and obvious creosote odor (FILL)	00000		2-	
-5 - ~- -		D	N/A	3/5	NVA	33	N/A	-0	Same as above with tar/geofabric interval @ approx. 11 to 12 ft. bgs (FILL)	00000		5- 6- 7- 8-	
- - 10 -								ļ.		00/		9-	
:	10.0 to 12.0 (SB-23-11)	D	. N/A	3/5	WA	ND.	"NA	5'	Fine, angular gravel black, saturated, medium dense (FILL)	02/		11-	
- 15						10	N/A	- - -	Clayey peat/native, dark brown, 7.5YR, 3/3, moist, soit (CLAYEY PEAT)	Z2 Z2	CL/PT	13- 14-	
. 15		D.	N/A	4.5/5	NA	ND	NA	:1ð	Fine, well sorted sand, dark grey, 10YR, 4/1, saturated, loose (SAND)	-	, SP	16~	
						ND ,	N/A		Silty clay, some fine gravel, reddish brown, 2.5YR, 4/4, moist, stiff (SILTY CLAY)		CĽ.	17- 18- 19-	
- 20					·			15 	Bottom of boring @ 20.ft. bgs			20 – 21 –	, :
- 25				,				 -			-	22 – 23 – 24 –	
					-	,		20 -				25 - 26 - 27 -	
- 30				·	•	-		- :				28 – 29 – 30 –	
bgs = 1 ND = n NM = r	ND: mean sea leve below ground surface of detected not measured not applicable		SAMPL D: driv W: was ST: She A: Aug HA: han C: core RC: rota	e hed lby Tub ler d auge ed	e r	MOISTI dry moist wet PROPOI	JRE: RTIONS	5-10: 11-29 30-45 50+:	medium dense 5-8; medium soft 58 - 23 (10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	4): VOCs 12): VOC	, SVOC Cs, SVC	s, PCBs, Select T/ DCs, PCBs; Select on): ore in pieces 4*	AL Metals TAL Metals

	CH2MHILL
resident	

PROJECT NAM	/E:	Quanta	Resor	urces	;			SURFACE ELEVATION:	6.5 ft.:	amsl			
LOCATION: _		Block 9		2					N/A				
PROJECT NUM	/BER:	332898	<u>}:</u>					MEASURING POINT ELEVAT		<u>N/A</u>	Α		
CLIENT:		Honeyw						TOTAL DEPTH: 25 ft.					
DRILLING CON	NTRAC	ror: S	GS En	vironr	mental :	Servic	es, Inc	FOREMAN: JF	Rousa				
DRILLING MET	HOD:	Direct F	² ush					DRILLING EQUIPMENT: Ge	юргоb	o 601	10		
				e sar	npler			CH2M OBSERVER: A	Harcle	rode			
START DATE:				<u> </u>				FINISH DATE: 10	/16/20	06			
				EAS				2 APPROX. DEPTH TO WATER			s 10/	16/06	
	- 1	T s î			SCREE		1 1	MATERIALS DESCRIPTION		- 1	Ö	WELL CONST	RUCTIO
DEPTH (FT. BGS) SAMPLE OR RUNDESIGNATION	SAMPLETYPE	BLOWS PER 6 (NCHES or CORE: RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	DA ⁻	EID OIL	ELEVATION (#. MSL.)	SOILS: density, color, classification, moisture, secondary grain size, and other descripture. ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing and degre	,	GRAPHICAL LOG	USCS GROUP SYMBOL		udinoman
SS PE	73	胃。	à a	ř		- E	一回	Types, weathering, and acgree or mac-	ig	Ö	: Þ	<u> </u>	 (,, 1)
0 to 2.0', (5 24-1.0)) NVA	:5/5:	:N/A	NĎ	N/A N/A	5	Silt, organic soil, dark brown, 7.5YR, 3/3, moist, loose (FILL) Intermixed silt, grave/fractured rock, cinder/stag, black, dry to saturated with depth, dense (FILL)		00000000000000000000000000000000000000		0 1- 2- 3- 4-	
-5.	D) N/A	4/5	NA	ND.	N/A.		Same as above (FILL)	-		į	5	
F		IWA	. 470	IWA.		N/A	L ₀	han the first to the first transfer to			SM .	6-	
					ZD ZD	N/A	-	Silty sand/native, black, moist, loose (SILTY SAN) Medium sand, brown, 7.5YR, 4/2, saturated, loose (SAND)			SP	7- 8- 9-	
10 10.0 to 12 (SB-24-1	2,0° D) NVA	3/5	ŅA	ND	.N/A		Same as above but medlum dense (SAND)				10 - 1 11 - 1 12 - 13 - 1 14 - 1	
—15 -	D) NÃ	3/5	ŇÁ	ND :	N/A	10	. Ŝame as above (SAND)				15 - 16 - 17 - 18 - 19 -	
- 20	Ö) NA	5/5	INA	ND	N/A	15	Silty sand, brown, 7.5YR, 4/4, saturated, loose (SILTY SAND)	**************************************	- T	SM	20 - 21 -	
					ND.	ŅĀ	-	Silty clay, brown, 7.5YR, 4/4, moist, dense (SILTY CLAY)	, -		ÇL	22	•
25	H		. 1	<u> </u>	<u> </u>	-		Bottom of boring @ 25 ft. bgs	7	王二		25-	
-		i.					20					26 - 27 -	
 		1					-			-	1	28 -	
							<u>-</u>					30]	
LEGEND: med = mean sea bgs = below gro surface ND = not detect NM = not meas N/A = not applie	ound ted sured	D: driv W: was ST: She A: Aug HA: har C: cor	shed elby Tul ger nd auge red	be er	SOIL: G MOISTU dry moist wet PROPOI	URE:	0-4: 5-10: 11-29 30-4: 50+:	: loose 3-4: soft. 9: medium dense 5-8: medium soft 9: dense 9-15: stiff 9: very dense 16-30: very stiff > 30: hard Density designation based on blow	(0 - 2): ium (10 - 12 ium K: rock qua	2): VOC	Cs, SVC	s, Select TAL Metals OCs, Select TAL Metals on): ore in pieces 4*	

CH2MHILL	

L			<u> </u>		1					45 4		
									SURFACE ELEVATION: 5.8	it. amsl	<u> </u>	
LOCA	TION:		Block 9	3, Lot	<u>î</u>		·		MEASURING POINT: N/A			
PROJ	ECT NUMBE	R:,_	332898	3		· · · · · · · · · · · · · · · · · · ·			MEASURING POINT ELEVATION	: <u>N</u>	Ά	
	NT:								TOTAL DEPTH:25 ft.			
DRILL	ING CONTRA								c: FOREMAN: J.Rous			
	ING METHO								DRILLING EQUIPMENT: Geoph			
SAME	ING METHO	D-	5 ft. ma	crocor	re:sa	mpler			CH2M OBSERVER: A.Haro	lerodé		
STAR	T DATE:	- -	10/13/2	2006					FINISH DATE: 10/13/			
					EAG	STING.			5 APPROX. DEPTH TO WATER: 4			
		.,				Ji Ma.			AFFROX, DEFINIO WATER: 12	.0 10.0	33.10/	10/00
			S (#			SCREE		· E	MATERIALS DESCRIPTION		2	WELL CONSTRUCTION
	NO.		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)		DA	TA 	ELEVATION (IL MSL)		٠,,	USCS GROUP SYMBOL	
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	щ	9 3	NO			ŀ	±		GRAPHICAL LOG	G.	j.
E)	SGO	SAMPLE TYPE	PER	PAT!				ŏ	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors	8	P.O.	
Ŧ	PLE	를	S S	SE	۵	_		VAT	BOCK rock type color, bardness, major mineral.	H	8	
병	SAN	SAR	P. P.	H.E.	P.O.	. e	E	E	types, weathering, and degree of fracturing	GR	Si	
		1				1					ļ	**************************************
o		<u> </u>	1 1000000000		<u></u>	ļ	<u> </u>	1		رريورا		0
-		D	NA	3.5/5	NA	ND	N/A	-5	Intermixed silt, coarse gravel/fractured rock, crushed concrete, and wood, black and white, dry to	S		
-			ŀ	1			ŀ	F	saturated with depth, medium dense (FILL)	00	'	2-
ŀ.		1		ŀ		-	ĺ.	Ħ		00/		3-
-			ŀ	1	ŀ			ļ.]	4-
-5		D	NA	4/5	NA	ND	N/A:		Same as above (FILL)	10° 1		5-
				1		ND.	N/A		Clay and friable coarse sand/fine, sub-rounded	00/	:	6-
				1		! .	-	Ŀ	gravel, while, moist, soft (FILL)	100		7-
			l:	1	ľ	ND	N/A	ļ.	Fine, angular gravet, black, saturated, medium	10°/		9.
10		2	7, 800					}	dense (FILL)	100		10-
-		D	NA	2/5	NA	ND.	NA	5	Same as above (FILL)	ي الم		10-
-								ľ	6.	10°/		12-
 	13' to 15' (SB-	1				ND	N/A	Ĺ.	Peat, some clay, dark brown, 7.5YR, 3/3, moist, soft (PEAT/CLAYEY PEAT)	بشك.	PT/CL	13-
T	26-14)	1	<u>.</u>						(PENI/OLATET PEAT)	الملا		14-
_ 15		D.	N/A	4/5	N/A	- 22	NA	-10	Same as above (PEAT/CLAYEY PEAT)	المنا		15-
-	:	Ĺ				j.].	F	;			16-
 		١.						F		,		18
- -			ļ:					ŀ.		-11	:	19-
- 20		D.	N/A	5/5	NA	ND /	N/A	-	Same as above (PEAT/CLAYEY PEAT)	بب		20-
T			ļ.			ND /	N/A/	15	Clayey sand, grey, Gley 1, 4/1, moist, medium	FI	ść	21
			ľ .			ND	N/A	. .		工	CL	22-
 					ŀ		;	<u> </u>	Silty clay, grey, 10YR, 4/1, grey, 10YR, 4/1 and yellowish red, 5YR, 4/6, moist, stiff (SILTY CLAY)			23-
- 25		<u> </u>	-	ļ	<u> </u>			-	Pattern State of Co. Co.	エ		25-
F			ļ.					-20	Bottom of boring @:25 ft. bgs			26-
+						·		-	•			27-
 					,		:	- .	•			28-
t												29-
-30					١.							30
	<u> </u>	L		<u> </u>	<u> </u>			l,				
	END: mean sea leve	á:	SAMPL D: driv		S:	OIL: GI	RANUI	AR SC	OILS DENSITY: PLASTIC SOILS DENSITY: NOTES: SB - 26 (13-	15); VOC	s svo	Cs, Select TAL Metals, Hex.
	below ground surface		W: was	shed	oe	dry	ıηE:	5-10	loose 3-4; soft Chromium 2: medium dense 5-8; medium soft	٠, ٠,٠,٠	,	, Treatment of Treatment of Treatment of the Inches
	not detected"		A: Aug HA: har	ger		moist wet		30-4	9: dense 9-15: stiff			
	not measured not applicable	•	C: cor	edi		PROPO		S:	>30: hard Density designation based on blow RQD (rock of			
1	*		RC: rota	asoille i	-016	Trace: <	5% F	w: 16	30% counts for each 12" of penetration reported in	% = [leng	th of c	ore in pieces 4"



BORING/WELL ID: TL 12-10.75

L					L							
PROJ	ECT NAME:		Quanta	Reso	urces				SURFACE ELEVATION: 6.7	ft. ams	<u> </u>	
LOCA	TION:		Block 9	3, Lot	<u>†</u>				MEASURING POINT: N/A			
PROJ	ECT NUMBE	R: _	332898	,					MEASURING POINT ELEVATION	4: <u>N</u>	/A .	
CLIEN	ΙŤ:	<u> </u>	Honeyw	vell.					TOTAL DEPTH: 30-ft.			
DRILL	ING CONTRA	ACT	OR: S	GS En					FOREMAN: J.Rou	sa		
DRILL	ING METHO	D: _	Direct F	ush					DRILLING EQUIPMENT: Geopi	obe.60	10	
									CH2M OBSERVER: A Har			
	T DATE:								FINISH DATE: 10/17/			
									3. APPROX. DEPTH TO WATER: 3		gs 10/	17/06
		Γ	s C	T		SCREE		1	MATERIALS DESCRIPTION	T	6	WELL CONSTRUCTION
(53	NO NO		inche (time/	E		DA	TA 	MSL)] g	SYMBOL	
DEPTH (FT. BGS)	SAMPLE OR RUNDESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)				EVATION (R.	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors	GRAPHICAL LOG	USCS GROUP	
OEPTH	SAMPL	SAMPL	BLOW!	RECO	ROD	Ö	윤	ELEVA	ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAP	nscs	
			.			i u						4
_0	0 to 2' (TL 12-	D	NVA	3.5/5	NA	N/A (rain)	N/A	F	Intermixed silt, coarse gravel, and cinder/slag, black,	O		
1 1	10.75-1.0)	-				(rain)		6	dry to moist with depth, medium dense (FILL)		9	2-
-								Ė	,	00	d] 3-] :
			:							No.		4-
-5		D	NA	4.5/5	:N/A	N/A	NA	1.	Same as above with incandescent sheen, obvious		3	5-
	6.5' to 7.5' (TL	┨ ゚				(rain)		о	product odor, and intermittent medium viscosity black product in pore space (FILL)	00	7	7-
-	12-10.75-7.0)	1			j	ŀ		-		No.	k	8=
-								Ė	: : :	NOX.	1	9=
- 10		D	NA	4/5	.N/A	. N/A	N/A	- T	Same as above with product observed (FILL)		1	105
Ĭ,			ļ.			(rain)		5		00		11-
								-				13 -
-	13.5 16 15.5	1				3		Γ.	7			14-
- 15	(TL 12-10-75- 14.5)	-	N/A	4/5	NA	N/A	NA	[Same as above but only trace product observed (FILL)	00/	1	15-
					ŀ	(rain)	ΝΆ	10	Clayey peat/native, dark brown, 7.5YR, 3/3, moist,	1	PT/CL	1 1 I
-						N/A (rain)		 	soft (CLAYEY PEAT)	17.5	1	18-
-								-			j	19
- 20		Б	N/A	5/5	NÃ	N/A	N/A	[Same as above (CLAYEY PEAT)		1	20 –
					ŀ	(rain)	"	15		-).=		21 -
_								-		-7.		23-
-						ŀ		Ė.		-72-5		24 -
- 25	,	Ď	N/A	3.5/5	NA	. N/A	ΝΆ	[Same as above (CLAYEY PEAT)	1/2/		25-
 						(rain)		20	,			26-
							455.	+ :		->-	01.100	28
- 30						(rain)	NA	-	Silty clay, reddish brown, 2.5YR, 4/3, moist, stiff (SILTY CLAY)	F.H.	CINÈC.	29 -
_ 50								-	Bottom of boring @ 30 ft. bgs	1		31 🗕
ļ									DILE DENGITY DI ACTIC COILE DENGITY NOTES:	ļ		
	END: :mean sealeve	el	SAMPL D: driv	/e	ES:	SOIL: G MOISTI		0-4:	very loose 0-2: very soft TL 12-10.75			s, SVOCs, PCBs, Select TAL.
bgs =	below ground surface	ĺ	W: was	lby Tu	be	dry moist		11-2	9: medium dense 5-8: medium soft Metals			ime analyses as above
	not detected not measured		A: Aug HA: har	nd aug	er	wet			very dense 16-30: very stiff ROCK:			
	not applicable		C: cor	ed asonic	core	PROPO	<5% F	ew: 16-	Density designation based on blow counts for each 12" of penetration reported in	% = [ler	igth of c	ore in pieces 4"
1						Little: 6	-15%S	ome: 3	1-49% using a 140 lb. hammer w/30" drop and longer/	length o	frun] x	100

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	CH2MHILL
religion.	

BORING/WELL ID: TL 14-09

RILLI	ING METHO): _	Direct P	ush			•	<u> </u>	DRILLING EQUIPMENT: Géopric CH2M OBSERVER: A Hard	be 60	10		: 2-2
	DATE:								FINISH DATE: 10/11/ APPROX: DEPTH TO WATER: 4			11/06	
1		24.5	ES.			SCRE	ENING	ł.	MATERIALS DESCRIPTION		SYMBOL	WELL CONSTRUC	TION
DEPTH (FT. 8GS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6.1NCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	RQD	Öld	FID	ELEVATION (ft. MSL.)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYM		
_0	0 to 2.0° (TL 14-09-1:0)	Ď	N/A	3.5/5	:N/A	ND .	- N/A	5	Intermixed fine sand, silt, gravel, and crushed rock, dark brown, 7.5YR, 3/3, dry, loose (FILL)	2000		0. 1— 2—	
-5	4.0' to 6.0' (TL 14.09-5.0)					ή	N/A		Fine, sub-angular gravel, cinder/slag, black, saturated; medium dense (FILL)			3- 4- 5-	
	13,00.007	D	NA	4/5	N/A	23	N/A N/A	0	Same as above (FILL) / Intermixed silt and fat clay, silt is dark brown, 7.5YR, 3/3, clay is white and light greenish gray, Gley 1,		9	6- 7-	
- 10	10' to 12' (TL	D	N/A	5/5	NA	130	N/A	-	8/1, some black product, solid, plastic far from 9.0 to 9.5 ft, bgs (FILL)	000		9-	
-	14-09-11)	Ų.	19/4	3/3	.e.			5	Same as above with solid, plastic tar @ approx. 12.0 to 12.3 ft. bgs (FILL)			11 -	
- 1 5	:	D	N/A	4/5	NA	16	N/A		Clayey peat, dark brown, 7.5YR, 3/3, moist, soft (CLAYEY PEAT) Fine sand, some peat, dark grev, 10YR, 4/1.	***	CL/PT	15-	
-	· ·					ND	NA	10	saturated, very soft, obvious sulfur odor (SAND) Same as above but no peat, some fine, rounded			16 - 17 - 18 -	:
- 20		a	N/A	5/5	NA	ND	.N/A		gravel (SAND) Medium sand, dark grey, 10YR, 4/1, saturated, medium dense (SAND)			19 – 20 – 21 –	•
	•					ND	NA	15	Silty clay, trace sand, dark yellowish brown, 10YR, 4/4, moist/saturated, stiff, low plasticity (SILTY CLAY)	***** 	CL	22 - 23 - 24 -	
- 25		-				- ;	<u></u>		Bottom of boring @ 25 ft. bgs	王		25 – 26 –	
 				-								27 – 28 – 29 –	
- 30												30 -	

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a marketonia.	Market Mr. St. Market St. Mr. W. St. 3 (1) Service Services
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BORING/WELL ID: TL 14-10.75

					1			·							
									SURFACE ELEVATION:						
	TION:				1			•	MEASURING POINT:	N/A			· · · · · · · · · · · · · · · · · · ·		
PROJ	ECT NUMBE								MEASURING POINT ELEVAT						
CLIEN	IT:		Honeyv	vell			,		TOTAL DEPTH: 25 ft.			<u>-</u>			
DRILL	ING CONTRA	ACT	OR: S	GS En	viron	mental	Servic	es, Ind	FOREMAN:J	Rousa			7	,	
DRILL	ING METHO	D: _	Direct F	ush				16. F.	DRILLING EQUIPMENT: Ge	eoprobe	e 60	10	p		
										Harcler					
	T DATE:								FINISH DATE:10	/13/200	06				
					EAS	STING:			APPROX. DEPTH TO WATER			as 10/	13/06		
			· · · · · · · · · · · · · · · · · · ·		7 ·					·			,		
			ES (#			SCRE		1	MATERIALS DESCRIPTION			g	WEL	L CONSTR	NUCTIO
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	- OA	FID	ELEVATION (ft. MSL.)	SOILS: density, color, classification, moisture; secondary grain size, and other descript ROCK: rock type; color, hardness, major minera types, weathering, and degree of fracturi	ors 1 ng	GRAPHICAL LOG	USCS GROUP SYMBOL		•	
	lidensky i jedi socijega					35.17					1				
_0		D	NA	2.5/5	NA	ND	N/A	5	Pulverized concrete (FILL)		30V	1	0		
	1' to 3' (TL 14	1			1	49	NA	†	<u> </u>				1	•	
 	10.75-2.0)							=. =.	Crushed grave/rock with cinder/slag, black, saturated, some solid, soft, plastic tar, some blac, product in pore space, obvious product odor (FiL.)	K K	3000 M		3-		
-5		D	NA	4/5	N/A	19	N/A	—o:	Same as above with product observed (FILL)		\$		5-		
÷						21	ΝVA		Fine sand, bluish grey, Gley 2, 5/1, saturated, ver- loose, pervasive black product in pore space with piece of solid, plastic tar from approximately 8.5 9.0 ft. bgs (FILL)	a to	\$05000 \$05000		6- 7- 8- 9-		
L 10				ļ	<u> </u>	33	NA	5	Same as 5 to 6.5 ft bgs above (FILL)		Ŝ		10-		
-		D.	N/A	2.5/5	N/A	45	N/A	- 77	Crushed gravel/rock with cinder/slag, black, saturated, some solid, soft, plastic tar, some black	k (\$0\$0 \$0\$0		11 - 12 -	•	• :
-						25	N/A	Ė	product in pore space, obvious product odor (FILI Peat; dark brown, 7:5YR, 3/3, moist, soft (PEAT)	-1_	II.	PT	13-		
15	14' to 16' (TL 14-10.75-15)	D:	. N/A	5/5	N/A	712	- N/A	-10	Same as above (PEAT)	- 1	<u></u>		15		:
	:							L	And the state of t	1	244		16 -		
-							ļ.	L			11-		18 -		
-							ĺ	F		-	ا ــلــــــــــــــــــــــــــــــــــ		19-		
- 20		D	N/A	4/5	NA	NĎ	, N/A	-15	Same as above (PEAT)		11.		20 -		
-								F.	* • • • • • • • • • • • • • • • • • • •		ш		21 -		
-						ND:	N/A		Sandy clay/sandy clay, grey, Gley 1, 5/1, moist, medium stiff/dense (SANDY CLAY)		- 1	CL/SC	23		
7 05								_		<u> </u>			24 - 25 -		
- 25 L			1 1 1 1 1 1					-20	Bottom of boring @ 25 ft. bgs				26		
L		Ι.											27		
-				1 .			ľ	ļ.			ı	:	28		
L.				l .				-		1			29 -		
- 30			ľ			-							30 _		
l.			<u> </u>	<u> </u>	L.	<u></u>					السنا				
msl = bgs = ND =	END: mean sea leve below ground surface not detected not measured	i	SAMPL D: driv W: wa ST: She A: Au HA: hai	ve shed elby Tu ger nd aug	ıbe	MOIST dry moist wet	URE:	0-4: 5-10 11-2 30-4 50+	loose 3-4: soft Metals: medium dense 5-8: medium soft 9-15: stiff very dense 16-30: very stiff ROC	10.75 (1 - 10.75 (14 - K:	- 16):	VOCs	SVOCs	CBs, Select T/	
	not applicable		C: cor RC: rot	red	_	PROPO			Density designation based on blow report	rock qual ed in % ≖	: [len	gth of c	ore in pi	eces 4"	,

CH2M	1.411.4
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BORING LOG BORING/WELL ID: TL 15-10.75

<u>L</u>									<u> </u>			
PROJ	ECT NAME:		Quanta	Reso	urce				SURFACE ELEVATION: 7.7		J:	
	TION:		Block 9						MEASURING POINT: N/A	5.44	 	1
	ECT NUMBER		332898	3				<u></u>	MEASURING POINT ELEVATIO	N: <u>N</u>	/A	
	IT:		Honeyv						TOTAL DEPTH: 50 ft.			
DRILL	ING CONTRA	CT	OR: S	GS En	viron	mental	Servi	ces, In	FOREMAN: J Rou	isa		
DRILL	ING METHO): _	Direct F	Push .	١.	· · · · · · · · · · · · · · · · · · ·		·	DRILLING EQUIPMENT: Geop	robe 60	10	
SAMP	LING METHO	D:	5 ft. ma	crocor	e sa	mpler			CH2M OBSERVER: A Hai	clerode		
STAR	T DATE:		10/16/2	006.					FINISH DATE: 10/16	/2006		
									APPROX. DEPTH TO WATER:		gs 10/	/16/06
		٠.	·	T		SCRE	ENING	T	MATERIALS DESCRIPTION	1	پ	WELL CONSTRUCTION
	Z		Ne/ft	E		DA	TA	3		-	MBO	WELFOONSTHOOLIG
DEPTH. (FT. BGS).	SAMPLE OR RUN DESIGNATION	SAMPLETYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft)	RECOVERY/ PENETRATION (F	a			ELEVATION (II, MSL.)	SOILS density; color, classification, moisture, secondary grain size, and other descriptors. ROCK rock type, color, hardness, major mineral	GRAPHICAL LOG	S GROUP SYMBOL	
DEF	SAN	SAN	BLC	Ää	- G	υG	8	H	types; weathering, and degree of fracturing	GR.	nscs	
						1	ŀ		·			
_0.	0 to 2.0° (TL 15-10.75-1:0)	D	.N/A	4/5	.N/A	ND.	NA		Intermixed silt, gravel, and crushed concrete, dark brown; 7.5YR; 3/3, dry to moist with depth, loose to dense (FILL):	000	d g	0 1-1 2-1
E								-	Crushed grave/rock and cinder/slag, black, saturated, medium dense, incandescent sheen.	100		3-
-5				<u> </u>		950	NA	}	obvious product odor, with black product in pore			5-
-0. -1: -7		Đ	N/A	1/5	N/A	350	N/A		Same as above with product observed (FILL)			6-
÷ Š	8.0° to 8.5° (TL 15-10.75-8.0)					6.8	N/A:	-	Gravelly silt, very dark grey, 10YR, 4/1, moist, dense (FILL)			8 9
- 10 -	·	.D	N/A	4/5	NA		N/A	E	Well graded; sub-angular gravel, black, saturated, medium dense; incandescent sheen, intermittent trace black product in pore space; obvious product	0		10 -
						ND	NA	5	odor (FILL) Silty sand, dark grey, 10YR, 4/1, and dark yellowish brown, 10YR, 3/4, saturated, medium dense (SILTY SAND)		SM	13 -
- 15 -	. :	D	N/A	5/5	ΝÀ	ND	NA	- 10	Fine to medium sand, dark yellowish brown, 10YR, 3/4, saturated, medium dense (SAND)		SP	16 - 17 - 18 -
<u>-</u> :								<u>-</u>				19
20 		Ď	. N/A	2/5	ŇĄ	ND	NÁ		Silty clay, brown, 7.5YR, 4/2, moist, stiff, low plasticity (SILTY CLAY)		CL	20 - 21 - 22 -
								15				23 - 24 -
25 -		D,	N/A	0/5	ΝA	ND	ΝA		No recovery			26 -
-								50			СН	27 - 28 -
- 30			· -					_				30 – 30 –
LEGI	END:	L	SAMPL	E TYPE	S:	 SOIL: G	ŔĂŊŬĬ	LAR SC	ILS DENSITY: PLASTIC SOILS DENSITY: NOTES:	<u> </u>		<u> </u>
msl = bgs = ND = NM =	mean sea level below ground surface not detected not measured	l.	D: driv W: was ST: She A: Aug HA: har	re shed slby Tul ger nd auge	oe.	MOISTI dry moist wet	JRE:	0-4: 5-10 11-2! 30-4 50+	Cory Cory	(0 - 2): \$ (8.0 - 8.5 (40.5 - 4 (47.0 - 4): Sele 1.5): PC 7.5): PC	ct TAL Métals Bs Bs
N/A =	not applicable		C: core		core	PROPOI Trace: < Little: 6-	5% Fe	w: 16	Density designation based on blow ROD (rock counts for each 12 of penetration reported in	% = [len	gth of c	ore in pieces 4"

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BORING/WELL ID: TL 15-10.75

L									
PROJEC	T NAME:		Quanta	Resou	irces				SURFACE ELEVATION: 7.7 ft. amsl
LOCATI	ON:		Block 9	3, Lot	1				MEASURING POINT: N/A
PROJEC	T NUMBER	}: _	332898						MEASURING POINT ELEVATION: N/A
CLIENT:	!		Honeyw	ell		<u></u>		<u></u>	TOTAL DEPTH: 50 ft.
DRILLIN	IG CONTRA	CT	OR: SO	GS En	vironr	nental :	Servic	es, Inc	c. J Rousa
DRILLIN	IG METHOD):	Direct F	ush					DRILLING EQUIPMENT: Geoprobe 6010
					esan	pler			CH2M OBSERVER: A Harclerode
	DATE:								FINISH DATE: 10/16/2006
					EAS	TING:			APPROX. DEPTH TO WATER: 4.5 ft. bgs 10/16/06
			f. S			SCREE			MATERIALS DESCRIPTION G WELL CONSTRUCTIO
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLETYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETHATION (FT.)	ROD	DA Old	Q.	ELEVATION (ft. MSL.)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types; weathering, and degree of tracturing WELL CONSTRUCTION WELL CONSTRU
30		Ď	N/A	: 5/6	≟N/A	ND	∴NA	-25	Fat clay, brown, 7.5YR, 4/2, moist, soft/medium stiff, plastic (CLAY)
35. - - -		D-	N/A	5/6	N/A	ND	NΨA		Same as above (CLAY) Glayey sand with some fine, sub-rounded gravel. dark reddish brown, 2.5YR, 3/4, moist, medium dense (CLAYEY SAND)
	40.5' to 41.5' (TL 15-10.75- 41)	Ο.	N⁄A	4,5/5	ΝA	ND ND	NVA NVA	- - 35	Well graded, fine to coarse sand, some coarse gravel, small cobbles, dark reddish brown, 2,5YR, 3/4, moist, medium dense/dense (SAND).
	47 O to 47.5 (TL 15-10.75- 47)	D	N/A	-4/5	, N∕A	ND.	:N/A	- - 40	Same as above, refusal @ approx. 50 ft. bgs 45 46 47 48 49 49 49 49 49 45
- 50		1 .						<u> </u>	Bottom of boring @ 50 ft. bgs 50
(
bgs = t ND = n NM = n	ND: mean sea leve pelow ground of detected not measured not applicable	sur	A: A: HA: ha C: co	rive ashed helby T uger and au ored	ube jer	SOIL: MOIST dry moist wet PROPO Trace: Little: 6	URE: RTION <5% F	0-4; 5-10 11-2 30-4 50+ IS: ew: 16	

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BORING LOG BORING/WELL ID: TL 16-06

-7960									
PROJ	ECT NAME:		Quanta	Reso	urces				SURFACE ELEVATION: 6.7 ft. amsl
LOCA	TION:		Quanta	Reso	urces	Prope	rty (Bl	ock 95	(Lot 1) MEASURING POINT: N/A
	ECT NUMBER		332898						MEASURING POINT ELEVATION: N/A
	rr:		Honeyv						TOTAL DEPTH: 30 ft
					viron	mental	Servic	es, In	FOREMAN: J.Rousa
	ING METHO								DRILLING EQUIPMENT: Geoprobe 6010
					e sar	npler			CH2M OBSERVER: A Harclerode
	T DATE:								FINISH DATE: 10/11/2006
NORT	HING:	8849	9.04		EAS	TING:	633	3212.6	2 APPROX. DEPTH TO WATER: 2.0 ft. bgs 10/11/06
	,		ES.	_		SCRE	ENING	ł	MATERIALS DESCRIPTION d WELL CONSTRUCTION
િછ	<u>0</u>		BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)				EVATION (ft. MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors.
оертн (гт. ваs)	SAMPLE OR RUN DESIGNATION	YPE	H. B. I	> NO				E 2	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing.
E	EOF	SAMPLE TYPE	S H	TRA T	1		<u> </u>	OTT	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. 및 명 및 명 및 명 및 명 및 명 및 명 및 명 및 명 및 명 및
Ē	J N	AMP.	8 8		ROD	OH OH	FID	LEV.	ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
ದ	35 EE	ဟ	:co: `	OE OL	1.5	7 27 27	L	ᇳ	
_0:							İ		0
_ U. -	Ø to 2.0' (TL 16-06-1.0)	D	NA.	3.7/5	NΑ	ND	NA	-	Intermixed silt; gravel, and sand, dark brown, 7.5YR,
<u>.</u> .	1,000-1,01,					ľ		5	3/3, moist to saturated with depth, medium dense to OAA 2-1 2-1
7	Ì		,		İ			Ē	[O2] [3-]
7 - -								ļ.	
-5 -		D	NA	4/5	NA	ÑD	N/A	-	Intermixed fine gravel, wood, and brick, dark brown, 7:5YR, 3/3, saturated, toose to medium dense (FILL)
<u>;</u>				1		ND.	N/A	0	7-
-			:		ŀ	0.3	N/A	[Clayey peat/native, dark brown, 7.5YR, 3/3, moist, CLPT 8- very soft (CLAYEY PEAT)
- 10			5		<u> </u>	737		ļ.	Sandy peat, brown, 10YR, 4/3, saturated, loose
11.O		D	N/A	NM	.N/A	N/A	· N/A:	-	(SANDI FEAT)
<u>:</u>								;5	Medium sand, brown, 10YR, 4/3, saturated, loose (Sleeve caught in barrel-material not observed in
÷			ľ.					<u>[</u> .	natural, undisturbed state) (SAND)
- 15		<u></u>		ļ	<u> </u>		ļ		14-
		D	N/A	NM	.N/A	N/A	N/A	-	Same as above (Sleeve caught in barrel-material not observed in natural, undisturbed state) (SAND)
-									17-
								Ľ.	18-
- 20		ئيسنا		<u> </u>	ļ	ļ		-	19-
<u>.</u>		D	:N/A	:NM	NA	N/A	-N/A	-15	Same as above but with some fine, sub-rounded gravel and incandescent sheen (Steeve caught in
			. 1					- 19	barrel-material not observed in natural, undisturbed state) (SAND) 22-
F	23' to 25' (TL 16-06-24)	:						<u>-</u>	24
- 25		D'	NA	NM	NA	N/A	N/A	ľ	Some of the control o
. .				''''	1,000	"	1777	20	Same as above but fine sand, no gravel or sheen (Sleeve caught in barrel-material not observed in
-								-	natural, undisturbed state) refusal @ approx, 30.2 ft. 27 – 28 –
-						ŀ		ļ.	29-
- 30				 	-		-	 	Bottom of boring @ 30 ft. bas
-									31.1
					Ľ,	L	<u> </u>	L	
	END: mean sea leve	i	SAMPL D: driv	/e	ES: S	SOIL: G		0-4:	DILS DENSITY: PLASTIC SOILS DENSITY: NOTES: TL 19-07 (0 - 2): VOCs, SVOCs, PCBs, TAL Metals, SPLP
	below ground surface		W: was	elby Tu	be.	dry moist	er time	5-10 11-2	liose 3-4; soft TL 16-07 (23 - 25): VOCs, SVOCs, PCBs, TAL Metals, SPLP
	not detected not measured		A: Aug HA: hai	nd aug	er	wet			9:dense 9-15:stiff Pock:
	not applicable	!	C: cor RC: rot	ed		PROPO			Density designation based on blow ROD (rock quality designation):
Ŀ.						Little: 6			



BORING/WELL ID: TL 16-07

PROJ	ECT NAME:		Quanta						SURFACE ELEVATION: 6.8 ft. amsl
LOCA	TION:		Quanta	Reso	urces	Prope	rty (Bl	ock.95	5, Lot 1) MEASURING POINT: N/A
PROJ	ECT NUMBE	R: _	332898	3					MEASURING POINT ELEVATION: N/A
CLIEN	VT:		Honeyv	vell"					TOTAL DEPTH: 30 ft.
•									C FOREMAN; J Rousa
DRILL	ING METHO	D: _	Direct I	Push					DRILLING EQUIPMENT: Geoprobe 6010
SAMP	LING METHO	DD:	5 ft. ma	crocor	e sai	npler			CH2M OBSERVER: A Harclerode
STAR	T DATE:		10/11/2	006					FINISH DATE: 10/11/2006
NORT	THING:	890	1.56		. EAS	STING:	633	3127.3	32 APPROX, DEPTH TO WATER: 4.0 ft. bgs 10/11/06
	-		(ES	-		SCREE		1 .	MATERIALS DESCRIPTION G WELL CONSTRUCTION
DEPTH (FT. 8GS)	SAMPLE OR RUN DESIGNATION	SAMPLETYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	Öld	FID	ELEVATION (IL MSL)	MATERIALS DESCRIPTION SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
	<u> </u>		With the						
0	0 to 2" (TL 16- 07-1:0)	Ď	ΝA	.2/5	ŅA.	ND	N/A		intermixed silt, gravel, and sand, some cinder/slag, black, dry to saturated with depth, medium dense (FILL)
-5 - -	8.0° to 10 (TL 16-07-9.0)	Ď	ÑĀ	2.3/5	Ń, A	0.3	ΝΑ	-0	Fine gravel; dark brown, 7.5YB, 3/3; saturated, medium dense, some viscous black product in pore space @ approx. 9.0 to 10.0 ft. bgs (FILE)
10 -		Ď	ŅŲĀ	5/5	N/A	2.3	N/A	- 5	Medium sand/native?, some rounded, fine gravel, dark grey, 19YR, 4/1 and light yellowish brown, 2.5YR, 6/3, saturated, medium dense (SAND)
15 -		D	.N/A	4/5	N/A	27.2	N/A	10	Clayey sand, some peat, dark brown, 7.5YR, 3/3, SC 16-16-
-			:	-		N/A	N/A		Well graded sand, dark grey, 10YR, 4/1, saturated, loose/medium dense (SAND)
20 - -		D	N/A	O/5	·N/A	ND	N/A	15	1
- 25		D	, N/A	4.5/5	N/A	NĎ	N/A		Silty clay, reddish brown, 5YR, 4/3, moist, medium Silty clay, reddish brown, 5YR, 4/3, moist, medium 25 - 26 - 26 - 26 - 26 - 26 - 26 - 26 -
30									Bottom of boring @ 30 ft: bgs
msl = bgs = ND = NM =	LEGEND: msl = mean sea level bgs = below ground surface ND = not detected NM = not measured N/A = not applicable SAMPLE TYPES W: washed ST: Shelby Tube A: Auger HA: hand auger C: cored RC: rotasonic co						URE: RTION <5% F	0-4: 5-10 11-2: 30-4 50+: IS: ew: 16-	OILS DENSITY: PLASTIC SOILS DENSITY: Very loose 0-2; very soft 0: loose 3-4; soft 10: loose 3-4; soft 29: medium dense 5-8; medium soft 49: dense 16-30; very stiff 5-30; very stiff 5-30; very stiff 5-30; very stiff County designation based on blow counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration 31.40% counts for each 121 of penetration

	CH2MHILL
A STATE OF THE PARTY OF THE PAR	CHZIVITILL
+175 Mars	

BORING/WELL ID: TL 16-09

•	ECT NAME:								SURFACE ELEVATION: 11.8 Lot 1) MEASURING POINT: N/A		ısl	
	ECT NUMBER								MEASURING POINT ELEVATION		I/A	
	IT:						. :-		TOTAL DEPTH: 25 ft.			
		ACT	OR: S	GS En	viron	mental	Servi	ces, in	C. FOREMAN: J.ROU			
	ING METHOI								DRILLING EQUIPMENT: Geopr			
									CH2M OBSERVER: Allero			
									FINISH DATE: 10/11/			
						STING:	63;	2974:5	3 APPROX, DEPTH TO WATER: 0			0/11/06
		1	£ ES €			SCREE	ENING TA	-1	MATERIALS DESCRIPTION	ļ.	ក្តី	WELL CONSTRUCTION
DEPTH (FT. BGS).	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (IIme/IL)	RECOVERY/ PENETRATION (FT.)	ROD	QIA	Ō	ELEVATION (It MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing.	GRAPHICAL LOG	USCS GHOUP SYMBOL	
ا						1				1		
_0		PD.	N/A	4/5	NA	1.0	NA	1.	Intermixed gravel, silt, and crushed rock black,	30	-	
	1.0 to 3.0 (TL 16-09-2.0)			1		180	NA	-10	saturated, loose (FILL)		4	2-
-				1 :	'			<u> </u>	Gravelly silt, very dusky red, 10A, 2:5/2, saturated, medium stiff, prominent incandescent sheen, and	SO ₂		-3-
-				ļ. :		32	N/A	İ	low viscosity product in gravel lense @ approx. 3.0 ft. bgs (FILL)	100	ď	4-
<u>-</u> 5		D	N/A;	3/5	NA	12.7	NA		Sandy silt, dark brown, 7.5YR, 3/3, saturated stiff, some nodules of black organic? material (FILL)			6-
-	7.0 to 9.0 (TL 16-09-8.0)					200	N/A		Same as above (FILE)	00		7- 8-
10		D	N/A	4.5/5	NA	27.2	N/A N/A	-	Sandy gravel, dark brown, 7.5YA, 3/3; saturated, medium dense, prominent incandescent sheen and black, medium viscosity product in pore space (FILLY)	OS.		9-
+ 1	-		1,30	4.00	i.e.o.	40	N/A	-0	Silt with fibrous wood, dark brown, 7:5YR; 3/3, moist, medium stiff (FILL?)			11 -
-	į					0.0	1,114	Ļ	Same as 6.75 to 9.0 ft. above but less product (FILL)	<u>~</u>		13
15		Q	N/A	4.5/5	N/A	2.2 ND	N/A N/A	L	Clayey peat, dark brown, 7.5YR; 3/3, moist, soft (CLAYEY PEAT)	-72-7	SP/PT SP	15
								5 	Peaty sand, dark grey, 10YR, 4/1, moist, soft to medium soft (PEATY SAND)			17 -
- 20	:	ì						<u> </u>	Split graded sand, fine and medium, dark greenish gray, Gley 1, 4/2, saturated, dense (SAND)			18-
-		Ď	NVA	4/5	NA.	ND	NA	ŀ	Silty sand graded into silt; dark grey, 7.5 (R, 3/1, saturated, medium dense (SAND AND SILT)	= :	SMML	20 -
-						ND:	N/A	-10	Silty clay, dark greyish brown, 10YR, 4/2 and dark grey, 10YR, 4/1, moist, stiff, low plasticity (SILTY CLAY)		CL	22 - 23 - 24 -
25					1.22			[Bottom of boring @ 25 ft. bgs	!- <u>-</u> -		25 -
								- 15				26- 27-
-								F				28
-30					-	,		-				29-
									•			
bgs = ND = NM =	END: mean sea leve below ground surface not detected not measured not applicable	i	SAMPL D: drlv W: was ST: She A: Aug HA: han C: corr RC: rota	e hed lby Tub ler id auge	oe er core	MOISTU dry, moist wet	RE: TION 5% Fe	5-10 11-29 30-4 50+ 5:	loose 3-4: soft: imedium dense 5-8: medium soft 0: dense 9-15: stiff very dense 9-15: stiff Very dense 16-30: very stiff Density designation based on blow counts for each 12: of penetration	9); VOC	Cs, SVO	Cs, PCBs, Select TAL Metals, Cs, PCBs, Select TAL Metals, on): ore in pieces 4"



BORING/WELL ID: TL 17-05

					<u> </u>											
PROJECT NAME: Quanta Resources										URFACE ELEVATION		ft. am	sl			
LOCAT	TION:		Edgewa	ater Er	nterpi	ises (B	lock 9	1, Lot	1)M	MEASURING POINT: N/A						
PROJE	CT NUMBER	R: _	332898	3					N	MEASURING POINT ELEVATION: N/A						
CLIEN	T;		Honeyv	vell		····	7.		Ť	OTAL DEPTH:	30 ft:		i	···········		·
DRILLI	NG CONTRA	CT	OR: S	GS En	viron	mental	Servic	es, Inc	<u>. </u>	OREMAN:	J Rous	sa			·	·
DRILLI	NG METHO):	Direct F	ush					D	RILLING EQUIPMEN	T: Geopre	obe 60	10		·	
						npler			c	H2M OBSERVER:	A,Haro	lerode				
START	DATE:		10/9/20	06					F	INISH DATE:	10/9/20	006				·
NORT	HING:71	8882	2.28		EAS	STING:	.633			PPROX. DEPTH TO V			ogs 10	0/9/06		
			S T			SCREE		1.	MA	TERIALS DESCRIPTI	ΟŅ		ъ	WELL	CONSTRUC	TIO
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE_TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	ROD	Q	TA.	ELEVATION (ft. MSL.)	ROCK: rock typ	color, classification, moi ary,grain size, and other e, color, hardness, major eathering, and degree of	mineral	GRAPHICAL LOG	USCS GROUP SYMBOL			
_0	Ø.Œ	S		11.11	- u.	n.	-	15			· · · · · · · · · · · · · · · · · · ·			0		
 		D	-N/A	3.5/5	NA.	ND	NA:	10.00	Sandy gravet, so rock, 7.5, YR 3/2 (FILL)	me crushed brick some dark brown, dry mediun	crushed n,dense			1-		:
-				ľ		NĎ	N/A		Course sand, ve	ry dark greenish grey, Gl	ey 1, 3/1,	00/		3-		
-						ND	NA	1	dry, dense, geof	abric @ appox. 3.5 ft. bgs	(FILL)			4-		
—5 -		Ď	N∕A	5/5	ŇĀ	ND	,ÑÁ:	10		h some crushed rock and brown, 7:5YR; 3/2, dry, i		000	:	6- 7-		
-				ĺ			Accept	<u> </u>	Same as 0 to 2.	75 ft. bgs above (FILL)			:	8-]		
- 10		Ð	N/A	3.5/5	N/A	ND 1.1.	N/A N/A	- 5	Crushed concret (FILL)	e and crushed brick, dry,	dense			9-		
-	10.5' to 12.5' (TL 17-05-	-				ND	N/A	Ė	Same as 0 to 2.7	75 ft. bgs above (FILL)			SP	11 -		
-	11.5)									sand/native, olive brown, to medium dense (SAND				13-		
15 		D	'N/A	5/5	N/A	ND '	·N/A	0		d some fine gravet, dark o saturated, medium dens				15- 16- 17- 18- 19-		
20 		D	N/A	5/5	N/A	ND	N/A	- 5.	Same as above,	but no gravel (SAND)	-			20 - 21 - 22 -	,	
-	23' to 25' (TL 17-05-24)							<u> </u>	Same an about	(C ANID)				23 - 24 - 25 -		
25 		D.	ΝA	5/5	NA	ND.	N/A	10	Same as above		, , , , , , , , , , , , , , , , , , ,		ĈĹ	26-		
 						ND.	NA	1	<u> </u>	own, 5YR, 4/4, moist, stiff	· · · · · · · · /	区)	خـــــــــــــــــــــــــــــــــــــ	27		
-						ND	NA	<u> </u> -		ome cobbles; course sub- 3, 5/4, saturated, dense, r /EL/SAND)	rounded, efusal @	0000	GE/GF	28 - 29 -		
30								-15	Bottom of boring	@ 30 ft. bgs		777		30 31 -		
bgs = ND = NM =	END: mean sea leve below ground surface not detected not measured not applicable		SAMPL D: driv W: was ST: She A: Aug HA: har C: cor RC: rote	/e shed elby Tu ger nd auge ed	be er	MOIST dry moist wet PROPO	URE:	0-4: 5-10 11-2 30-4 50+	very loose : loose 9: medium dense 9: dense : very dense Density de	ASTIC SOILS DENSITY: 0-2: very soft 3-4: soft 5-8: medium soft 9-15: stiff 16-30: very stiff > 30: hard signation based on blow each 12: of penetration	Metals, SPLI	23 - 25): (23 - 25): Juality de	VOCs	, SVOCs,	OCs, PCBs, TAL PCBs, TAL Metals	

	CH2MHILL
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BORING/WELL ID: TL 17-06

					<u> </u>				
PROJECT N	AME: _								SURFACE ELEVATION: 6.8 ft. amsl
LOCATION:	100				urces	Prope	rty (Bl	ock 95	5, Lot 1) MEASURING POINT: N/A
PROJECT N									MEASURING POINT ELEVATION: NA
CLIENT:									TOTAL DEPTH: 25 ft.
						mental	Servic	es, In	nc. J. Rousa
DRILLING M									DRILLING EQUIPMENT: Geoprobe 6010
									CH2M OBSERVER: A Harclerode
									FINISH DATE: 10/12/2006
NORTHING:	718	923	3.63	·····	EAS	TING:	633	3252.6	64 APPROX. DEPTH TO WATER: 2.0 ft. bgs 10/12/06
		_	ωG	<u> </u>		SCRE	ENING		MATERIALS DESCRIPTION 6 WELL CONSTRUC
DEPTH (FT. BGS) SAMPLE OR	RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	Rap	DA O	TA QL	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing
O;	ř	D.	N/A	3/5	N/A.	.ND:	N/A-	 - -	Intermixed silt, grave), some cinder/slag, black and dark brown, 7.5YR, 3/3, moist, medium dense (FILL)
						, ND	1	-5	1:00
3.0° to 1	5.0 (TL 5-4.0)			ļ: ;		ND	N/A N/A	1	Gravelly clay; dusky red, 10R; 3/3; saturated, soft (FILL) Sandy gravel, dark brown, 7.5YR; 3/3 and brown
5"	· · ·	D	N/A	3/5	N/A:	12.3	N/A	Ė.	10YR, 5/3, saturated, medium dense (FILL)
						ND	ŃA:	-0	Clayey peat/native; some sand, dark brown, 7.5YR, 3/3, moist, soft (CLAYEY PEAT).
									Fine sand, some organic material, brown, 7.5YR, 4/2, saturated, loose (SAND)
<u>10</u>		D'	N/A	5/5	N/A	ND	NA	5	Medium sand, some fine, sub-rounded gravel, brown, 7.5YR; 4/2, saturated, medium dense (SAND)
— 15 -	-	D.	NĄ	5/5	NA	ND	NVA	-	Sandy clay, brown, 7.5YR, 4/2, saturated, medium sc SC 15-16-
-			-			ND,	N/A	10	Fine to medium sand, brown, 7.5YR, 4/2, saturated. SP 17-16ose (SAND) 18-
-20		,				ND	· Sui		Same as 15 to 16 ft. above (SANDY CLAY)
-	in the second se	D.	N/A	3/5	N/A	ND	N/A N/A	- 15	Gravelly sand, sub-rounded medium gravel, plinkish grey, 7.5YR, 4/2; moist, dense (GRAVEL/SAND) Sandstone some slitstone, weathered, bleck and
- 1	ľ	,	:			NĎ	N/A	-	Sandstone some siltstone, weathered, black and pinkish grey, 7.5YR, 4/2 (SANDSTONE)
- 25					·			[.	Bottom of boring @ 25 ft. bgs
<u> </u>	-							20	26 - 27 -
 	ŀ							ŀ.	28 -
	ŀ								29 –
30	1								30-1
LECEND	l_		SAMPL	FTVDE	g. lr	Oil	DANI	An	DILS DENSITY PLASTIC SOILS DENSITY: NOTES:
LEGEND: msl = mean s bgs = below surface ND = not det NM = not me N/A = not app	ground e ected asured	v	D: driv W: was ST: She A: Aug HA: han C: core RC: rota	e hed lby Tub er d auge ed	r ore	MOISTU dry moist wet PROPOI frace: <	JRE: RTION :5% Fe	0-4: 5-10 11-2: 30-4: 50+: S:	very loose 0-2: very soft 3-4: soft 9: medium dense 9-15: stiff 9: dense 9-16: stiff 5-30: very stiff 5-30: hard Density designation based on blow Page 16: stiff 16: soft 9-16:



BORING/WELL ID: TL 17-07

L					<u> </u>					
PROJE	ECT NAME:		Quanta	.Reso	urces		,		SURFACE ELEVATION: 6.9 ft. amsl	1.
LOCA	TION:		Quanta	Reso	urces	Prope	rty (Bl	ock 95	5, Lot 1) MEASURING POINT: N/A	
PROJE	ECT NUMBE	R: _	332898	3					MEASURING POINT ELEVATION: N/A	
CLIEN	Т:		Honeyv	vell		····		* ;	TOTAL DEPTH: 20 ft.	
DRILL	ING CONTR	ACT	or: S	GS En	viron	mental	Servic	es, In		
DRILL	ING METHO	D: _	Direct F	^o ush						
					re sar				CH2M OBSERVER: A Harclerode	
	ΓDATE:		10/12/2						FINISH DATE: 10/12/2006	
			2.23						APPROX. DEPTH TO WATER: 2.0 ft. bgs 10/12/06	
		·	1	1	Т	CODE		T	MATERIAL O DESCRIPTION	
			LOWS PER 6 INCHES or CORE RUN (time/ft.)	- ا		SCRE	TA	4	MATERIALS DESCRIPTION O SOILS: density, color, classification, moisture, secondary grain size, and other descriptors	ONSTRUCTION
ŝ	NO E	ľ.	N E	=				MSL)	98 XXV	
(FT. BGS)	GNA	Y PE	8 H S	≥Ē				E Z	SOILS: density, color, classification, moisture,	
H)	LE O	LE T	/S PI	YEF		ľ		ATIC	secondary grain size, and other descriptors	
DEPTH	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/ PENETRATION (FT.)	g g	G.	<u>e</u> ;	ELEVATION (ft.	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	
	Ø. II.	+			-	· · · · · · · ·				
_o		-			L.,				0	;
- 1		.D	N/A	0/5	N/A	NA	NA.	F	Intermixed silt and concrete (sleeve fell out of barrel)	
F		1						—š	2-	
 						-			34	
ا ۽ ا] .		4-	
 		D	NA	0.8/5	N/A	ND	N/A	_	Fractured rock/coarse angular gravel, some clay.	•
<u> </u>				ŀ				0-	gravel is black, clay is white, saturated, loose (FILL)	
-		1				:	ŀ	}	B-	
-							Î	F	Well graded sand, fine to medium/coarse, brown, 7.5YR, 4/2 with some dusky red hue, 10R, 3/3,	
- 10	10' to 12' (TL	D	NA	5/5	NA.	ND	NA	İ	moist, dense (FILL?)	
	17-07-11)					47	N/A	5	Clayey peat/native; very dark brown, 7.5YR, 2/2,	
[ŀ		,6	NA	-	moist, medium suir (CDATET PEAT)	
-				ŀ				-	Same 10 to 11 ft. above but grey, Gley 1, 5/1(SAND)	
- 15		D	NA	5/5	NA:	ND"	N/A	Ė	Same as above but loose (SAND).	
		1							16-	
		1				ND	N/A	ŀ	Silty clay, reddish brown, 5YR, 4/3, moist, medium CL 18	
- 1				ŀ				-	stiff (SILTY CLAY)	
-:20		-	-	ļ	 		ļ:	T	Bottom of boring @ 20 ft. bgs	
			ŀ				ľ	15	21 - 22 -	
								-	23-	
-		İ					1	- -	24-	
-25			-					 -	25-	
- 1								h .	26 -	
-								20	27	
F									20 7	
-30								L		
30										
LEGE	ĖND-		SAMPL	E TYP	ES:	SOIL: 0	RANII	LAR S	OILS DENSITY: PLASTIC SOILS DENSITY: NOTES:	
msl =	mean sea lev		D: driv	ve .		моїзт		0-4:	very loose 0-2; very soft (10-12); Select TAL Metals, He splip (10-12); Select TAL Me	x: Chromium,
-	below ground surface	2	ST: She	elby Tu	be	dry moist wet		11-2 30-4	29; medium dense 5-8; medium soft 49; dense 9-15; stiff	
NM =	not detected not measured		HA: hai	nd aug			DITIO		: very dense 16-30: very stiff ROCK: S30: hard ROD (rock quality designation):	
N/A = not applicable C: cored RC: rotasonic co				core	PROPO	<5% F	io. ew: 16		.4*	

9	H2MHILL
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BORING LOG

BORING/WELL ID: TL 17-08

					L							
PROJ	ECT NAME:								SURFACE ELEVATION: 7:2 f	t. amsl	l	
	TION:								, Lot 1) MEASURING POINT: N/A			
PROJ	ECT NUMBER								MEASURING POINT ELEVATION	: <u>N</u>	/A	
,	[T;		Honeyw						•			
												····
									DRILLING EQUIPMENT: Geopre			
									CH2M OBSERVER: A Hard			
	T DATE:	:	· .						FINISH DATE: 10/12/2			
NORT	HING:71	901	6.20		EA!	TING:	_632	069.9	APPROX. DEPTH TO WATER: 2	0 ft. b	gs 10/	12/06
			w a	<u> </u>		SCREE		Ì	MATERIALS DESCRIPTION	1	٦	WELL CONSTRUCTION
DEPTH (FT. BGS)	SAMPLE OR RUN DESIGNATION	SAMPLE TYPE	BLOWS PER 6 INCHES or CORE RUN (time/ft.)	RECOVERY/	ROD	DA GE	TA E	ELEVATION (ft. MSL)	SOILS: density, color, classification, moisture, secondary grain size, and other descriptors. ROCK: rock type, color, hardness, major mineral types, weathering, and degree of fracturing	GRAPHICAL LOG	USCS GROUP SYMBOL	
_0	0 to 2.0 (TL 17-08-1:0)	D	N/A	4/5	NA	11,3	NVA	-5	Intermixed gravel, silt, sand, and cinder/slag, black and dark brown, 7.5YR, 3/3, moist to saturated with depth, medium dense, some solid, plastic tar (FILL)	0.000		0 1-1-1-2-1
- - -5	3.0' to 5.0' (TL 17-08-4.0)					ND:	N/A	ŀ	Sandy gravel, some silt and crushed concrete, dusky red, 10YR, 4/3, saturated, medium dense (FILL)	000		3- 4- 5-
<u>.</u>		D).	N/A	3/5	·Ń/A.	ND-	N/A	-0	Same as above but no concrete or slit (FILL)	00/		6- '7-
10						172	N∕A	-	Clayey peat/native, dark brown, 7.5YR, 3/3, saturated, soft, obvious sulfur odor (CLAYEY PEAT)	2	СШРТ	8- 9-
- 1.0,		D	N/A	4.5/5	·N/A	ND.	N/A	-5	Same as above (CLAYEY PEAT)	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\		10 - 11 - 12 - 13 - 14 - 14 - 14 - 14 - 14 - 14 - 14
15 		D	N/A	4.5/5	ŅΑ	ND	NA	10	Fine sand, dark grey, 10YR, 3/1, saturated, medium dense, trace rounded fine gravel (SAND)	-7-	SP	15 16 17 18
- 20 - - -		D	NA.	4/5	ΝA	ΝĎ	NVA		Well graded sand, clayey to coarse sand, brown, 7.5YR, 4/2, saturated, loose (SAND)			19 - 20 - 21 - 22 - 23 -
- 25						ND	ΝA	-	Silty clay, brown, 7.5YR, 4/2, moist, stiff, low plasticity (SILTY CLAY)	***** T	CL	24
								20	Bottom of boring @:25 ft: bgs			25 – 26 – 27 – 28 – 29 – 29 – 29 – 29 – 29 – 29 – 29
- 30	-ND-		SAMPL	E TYPE	S∙ c	OII - C	RANIA	AP S	DILS DENSITY PLASTIC SOILS DENSITY. NOTES:			30 3
msl = bgs = ND = NM =	END: mean sea level below ground surface not detected not measured not applicable		D: driv W: was ST: She A: Aug HA: han C: core RC: rota	e hed lby Tul jer id auge	oe er core	MOISTL dry moist wet PROPOI Trace: < Little: 6-	IRE: RTION 5% Fé	0-4: 5-10: 11-25 30-4: 50+: S:	very loose 0-2: very soft 1.1-08 (0-100 se 3-4: soft 1.2-08 (0-100 se 3-4: soft 1.2-08 (0-100 se 3-4: soft 1.2-08 (0-100 se 1.2-08) series 1.2-08 (0-100 se 1.	um, SPL 5): VOC um, SPL uality de 5 = [len	P S, SVO P esignation	ore in piecos 4"

0

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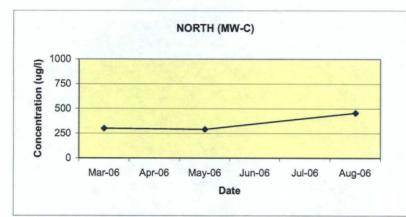
.

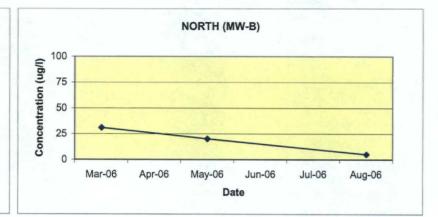
Concentration vs. Time Plots - Benzene

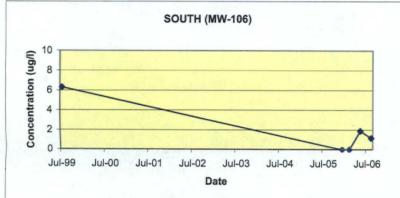
Well	Date	Benzene Conc. (ug/L)
West		
MW-L	3/15/2006	ND
MW-L	5/24/2006	ND
MW-L	8/24/2006	ND
MW-101	11/23/1998	4.4
MW-101A	11/17/2005	ND
MW-101A	2/21/2006	ND
MW-101A	5/22/2006	ND
MW-101A	8/21/2006	ND
North		
MW-C	3/13/2006	300
MW-C	5/22/2006	290
MW-C	8/24/2006	456
MW-B	3/13/2006	31
MW-B	5/23/2006	20
MW-B	8/24/2006	5

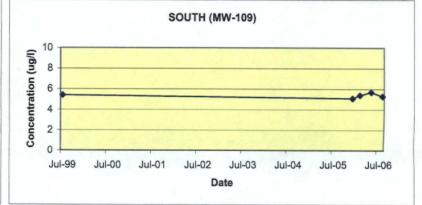
Well	Date	Benzene Conc. (ug/L)
South		
MW-108	7/9/1999	3.1
MW-108	12/7/2005	ND
MW-108	5/17/2006	ND
MW-108	8/18/2006	ND
MW-106	7/8/1999	6.3
MW-106	12/6/2005	ND
MW-106	2/13/2006	ND
MW-106	5/16/2006	1.9
MW-106	8/15/2006	1.2
MW-109	7/9/1999	5.4
MW-109	12/6/2005	5.1
MW-109	2/15/2006	5.4
MW-109	5/17/2006	5.7
MW-109	8/17/2006	5.3

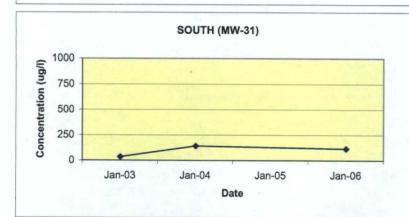
Well	Date	Benzene Conc. (ug/L)
South		
MW-31	10/1/2003	34
MW-31	11/29/2004	140
MW-31	8/16/2006	114
MW-29	6/11/2003	1400
MW-29	10/1/2003	4600
MW-29	12/3/2004	860
MW-29	8/16/2006	710
MW-103	11/23/1998	2200
MW-103	11/18/2005	860
MW-103	2/20/2006	980
MW-107	7/8/1999	5300
MW-107	12/6/2005	640
MW-107	2/16/2006	970

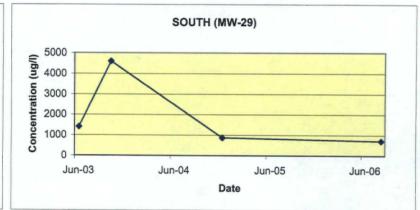


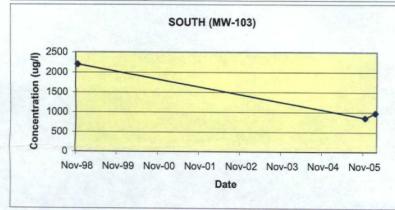


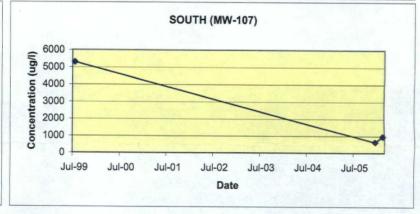










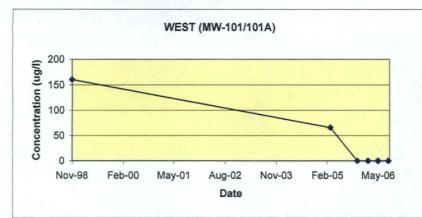


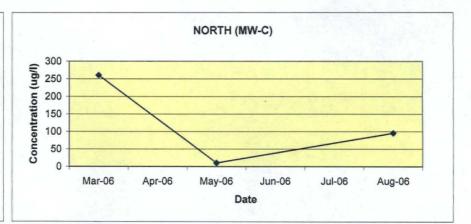
Concentration vs. Time Plots - Naphthalene

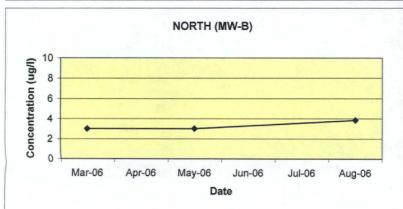
Well	Date	Naphthalene Conc. (ug/L)
Vest		
MVV-L	3/15/2006	ND
MW-L	5/24/2006	ND
MW-L	8/24/2006	ND
MW-101	11/23/1998	160.0
MW-101A	3/21/2005	65.5
MW-101A	11/17/2005	ND
MW-101A	2/21/2006	ND
MW-101A	38855	ND
MW-101A	38859	ND
MW-101A	8/21/2006	ND
North	VI SAME I	
MW-C	3/13/2006	260
MW-C	5/22/2006	10
MW-C	8/24/2006	95.4
MW-B	3/13/2006	3
MW-B	5/23/2006	3
MW-B	8/24/2006	3.85

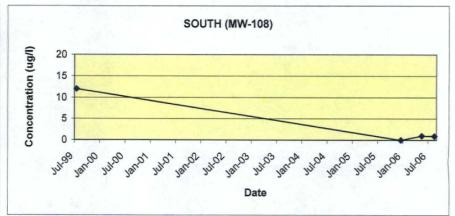
Well	Date	Naphthalene Conc. (ug/L)
outh		
MW-108	7/9/1999	12.0
MW-108	12/7/2005	ND
MW-108	5/17/2006	1.0
MW-108	8/18/2006	0.9
MW-106	7/8/1999	1200
MW-106	12/6/2005	ND
MW-106	2/13/2006	ND
MW-106	5/16/2006	7
MW-106	8/15/2006	10.8
MW-109	7/9/1999	160
MW-109	12/6/2005	110
MW-109	2/15/2006	130
MW-109	5/17/2006	160
MW-109	8/17/2006	86.2

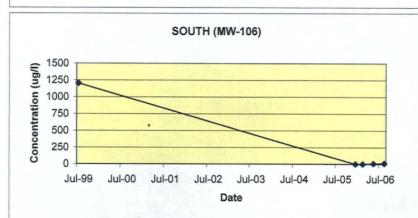
Well	Date	Naphthalene Conc. (ug/L)
South		
MW-31	11/29/2004	600
MW-31	8/16/2006	683
MW-31	8/16/2006	570
MW-29	6/11/2003	1300
MW-29	10/1/2003	3200
MW-29	12/3/2004	2300
MW-29	8/16/2006	1400
MW-103	11/23/1998	16000
MW-103	11/18/2005	15000
MW-103	2/20/2006	18000
MW-107	7/8/1999	11000
MW-107	12/6/2005	14000
MW-107	2/16/2006	15000

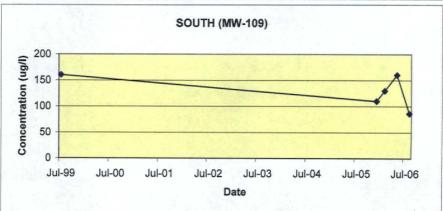


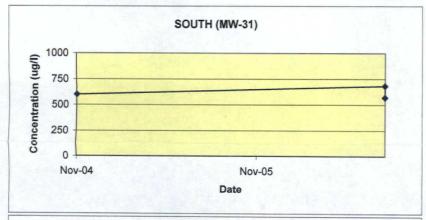


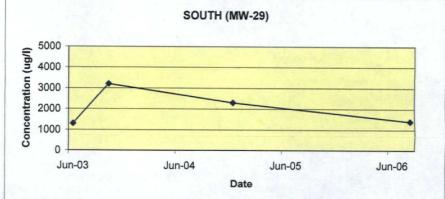


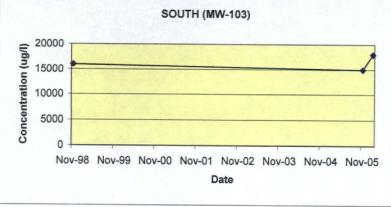


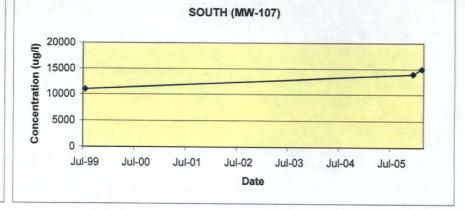




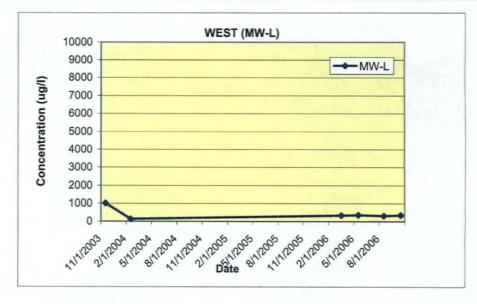




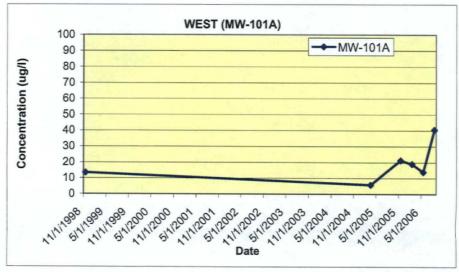




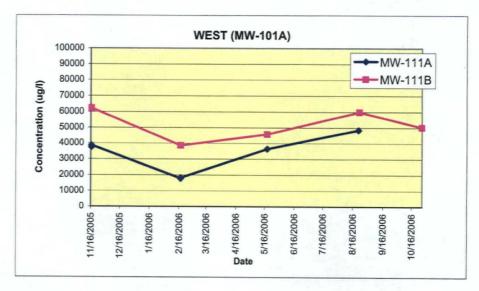
	Date	MW-L
MW-L	11/01/03	1010
	02/01/04	136
	3/15/2006	339
	5/24/2006	365
	8/24/2006	321
	10/26/2006	356



2.5	Date	MW-101
MW-101A	11/23/1998	13.4
	3/21/2005	5.9
	11/17/2005	21.3
	2/21/2006	19.1
	5/18/2006	14.0
	8/21/2006	40.6



	Date	MW-111A	MW-111B
MW-111A	2/17/2006	17800	
	11/16/2005	37400	LEU
	2/17/2006	18200	
	5/18/2006	36400	175.77
	8/21/2006	48400	
	11/16/2005	38600	14. E. L.
MW-111B	2/17/2006		38500
	5/18/2006		45700
	8/22/2006		59800
	10/26/2006		50200
	11/16/2005		62100



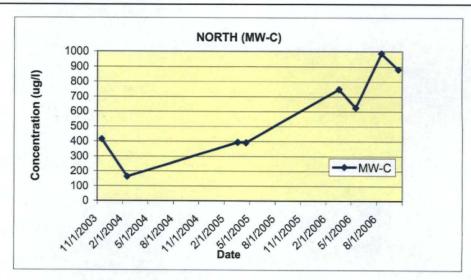
NORTH

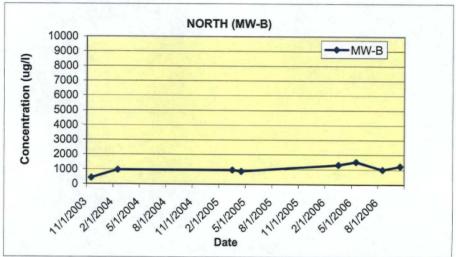
	Date	MW-C
MW-C	11/1/2003	413
	2/1/2004	162
	3/1/2005	393
	4/1/2005	390
	3/13/2006	748
	5/22/2006	624
	8/24/2006	987
	10/24/2006	880

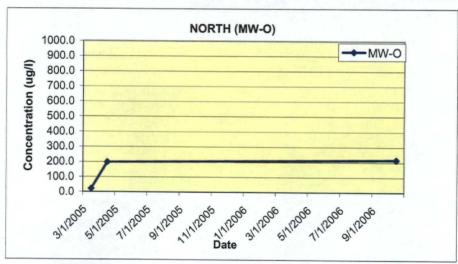
	Date	MW-B	MW-20
MW-B	11/1/2003	433	
	2/1/2004	949	
	3/15/2005	953	
	4/18/2005	873	
	3/13/2006	1320	
	5/23/2006	1520	
	8/24/2006	992	
	10/24/2006	1230	

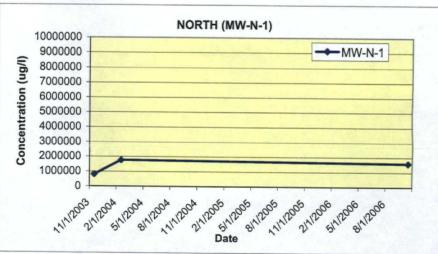
	Date	MW-O
MW-O	3/16/2005	21.5
	4/18/2005	199
	10/25/2006	216

	Date	MW-N-1
MW-N-1	11/1/2003	809000
	2/1/2004	1770000
	10/25/2006	1590000





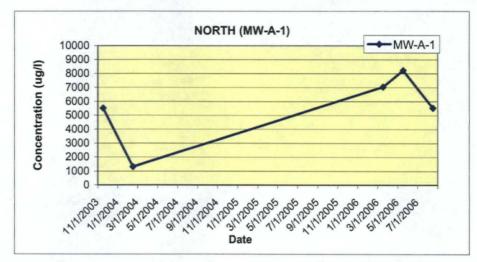




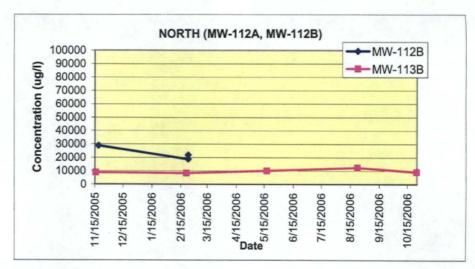
	Date	MW-A-2	MW-N-2
MW-A-2	11/1/2003	57200	
	2/1/2004	69100	
	8/24/2006	95800	
	38790	126000	HEER TH
	5/23/2006	27900	
	8/24/2006	84200	18.5
	10/25/2006	75700	
MW-N-2	37926		14200
	2/1/2004		11000
	10/25/2006	12 12 19	17900

1000000			(Fig. 5)	£ 5.				I		MW-	A 2
800000 700000 600000 500000 400000 300000 200000						of the s				MW-	10000
700000	y.	100						1	2 117 12		
500000					7					1770	
400000	4	*			+						
300000							1 1 100				
100000						72	111				-
0 -		1		-	1	10			-	-	
11/1/2003	2/1/2004	5/1/2004	8/1/2004	11/1/2004	2/1/2005	5/1/2005	8/1/2005	11/1/2005	2/1/2006	5/1/2006	8/1/2006
1/2	11/2	11/2	11/2	11/2	11/2	11/2	11/2	11/2	11/2	11/2	11/2

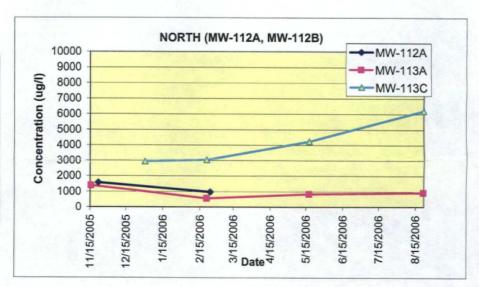
	Date	MW-A-1
MW-A-1	11/1/2003	5510
	2/1/2004	1310
	3/14/2006	7030
	38860	8210
	8/23/2006	5530



	Date	MW-112B	MW-113B
MW-112B	2/22/2006	18500	
	2/22/2006	21800	
	11/18/2005	28800	
MW-113B	38768	PER TITLE	8280
	5/17/2006		10100
	38951		12400
	10/24/2006		9110
	11/15/2005		8750



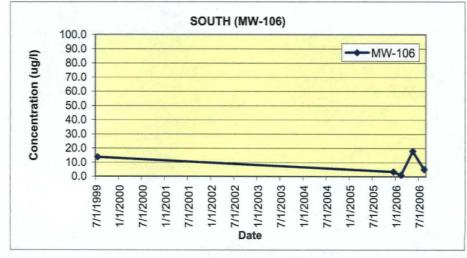
	Date	MW-112A	MW-113A	MW-113C
MW-112A	2/23/2006	965	-	
	11/21/2005	1570		
MW-113A	2/20/2006	1 TO 1	565	
	38854		834	1 1 2 1 1
	8/21/2006		923	
	38671		1380	
MW-113C	12/30/2005	The Roll of the State of the St		2930
	2/20/2006		Can Little	3030
	38854	4 = 12 + 12 + 11		4240
	8/21/2006	The second	Ball Control	6210



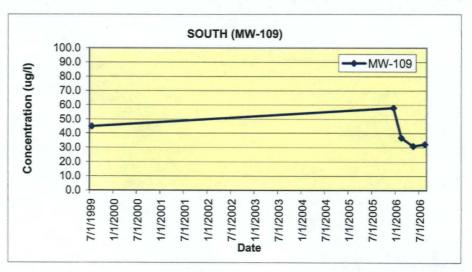
	Date	MW-108	1 18 6
MW-108	7/9/1999	1.8	1/2 DL
	12/7/2005	5.2	Die .
	5/17/2006	1.5	1/2 DL
	38947	1.7	1/2 DL

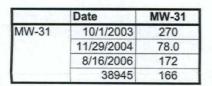
	9 8	307									E	← N	/W-1	108	
Concentration (ug/l)	7 6 5 4 3													1	
3	2 1 0	1/1/2000 -	7/1/2000 -	- 1003	- 1003	1/1/2002 -	7/1/2002 -	1/1/2003 -	5003	1/1/2004 -	- 5003	1/1/2005 -	- 5002	1/1/2006	9002
	7/1/7	1/1/2	7/1/2	1/1/2001	7/1/2001	1/1/2	7/1/2	2/1/1 ate	7/1/2003	1/1/2	7/1/2004	1/1/2	7/1/2005	1/1/2	7/1/2006

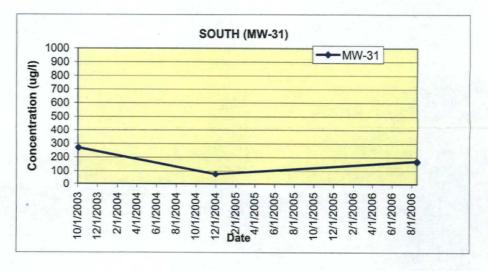
5	Date	MW-106
MW-106	7/8/1999	13.7
	12/6/2005	3.3
	2/13/2006	1.0
	38853	17.8
	38944	5.1



	Date					
MW-109	7/9/1999	44.9				
	12/6/2005	57.9				
	2/15/2006	36.9				
	38854	31.1				
	38946	32.3				





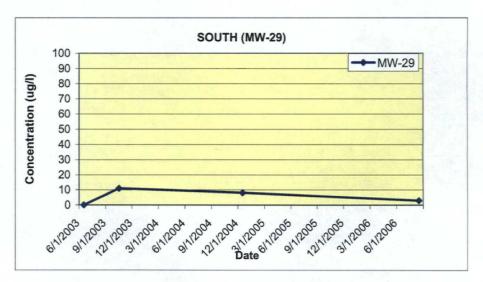


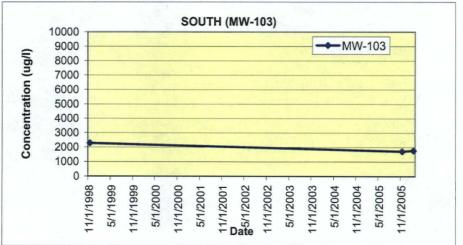
	Date	MW-29	15.7
MW-29	6/11/2003	0	
	10/1/2003	11.0	
	12/3/2004	8.1	
	38945	3	1/2 DL

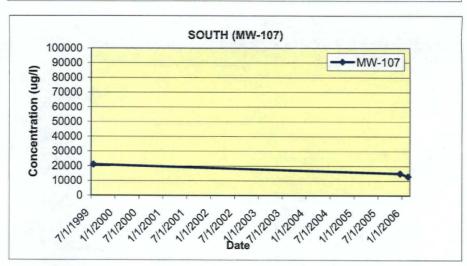
	Date	MW-103
MW-103	11/23/1998	2280
	11/18/2005	1720
	2/20/2006	1780

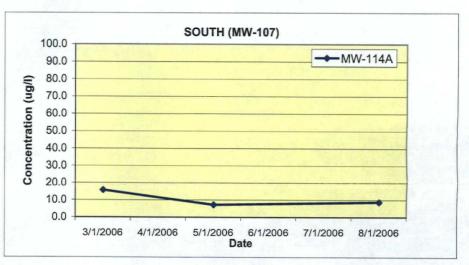
	Date	MW-107
MW-107	7/8/1999	20900
	12/6/2005	14800
	2/16/2006	12900

	Date	MW-114A
MW-114A	3/4/2006	15.7
	5/20/2006	7.2
	8/19/2006	8.7

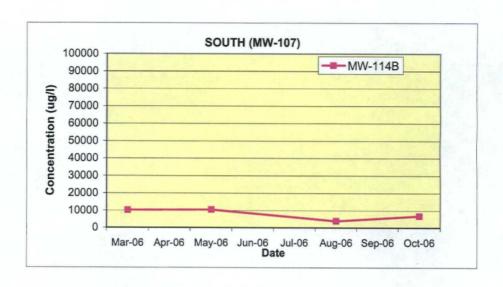






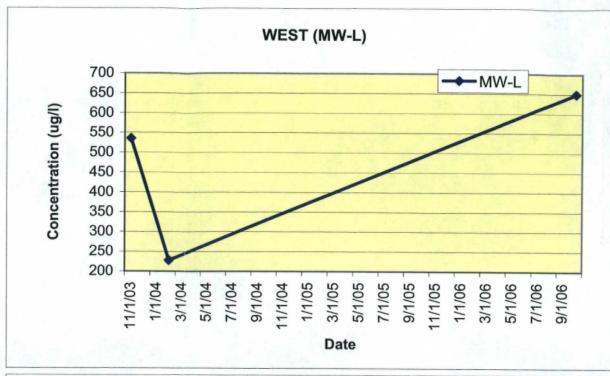


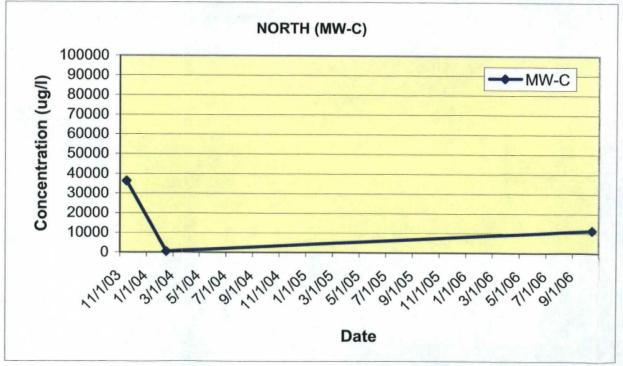
12 Lines	Date	MW-114B
MW-114B	3/4/2006	10200
	5/20/2006	10400
	8/26/2006	3810
	39016	6820



	Date	MW-101A
MW-L	11/01/03	536
	02/01/04	229
A	10/26/2006	650

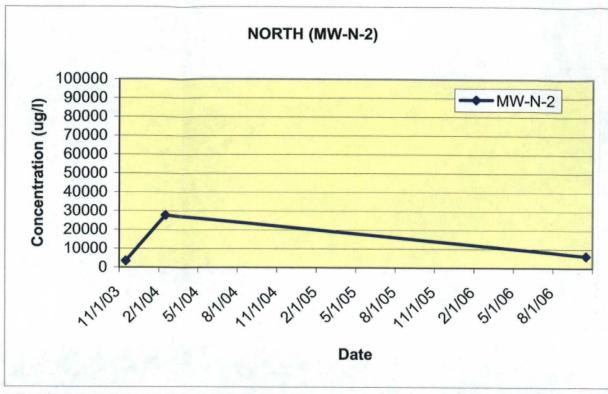
	Date	MW-C
MW-C	11/01/03	36400
	02/01/04	604
	10/24/2006	11500

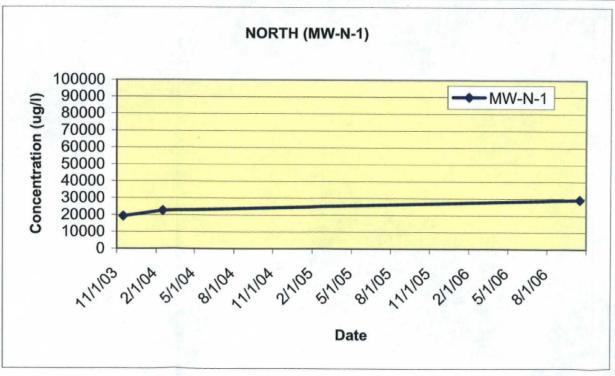




	Date	MW-N-2
MW-N-2	11/01/03	3660
	02/01/04	27900
	10/25/2006	6540

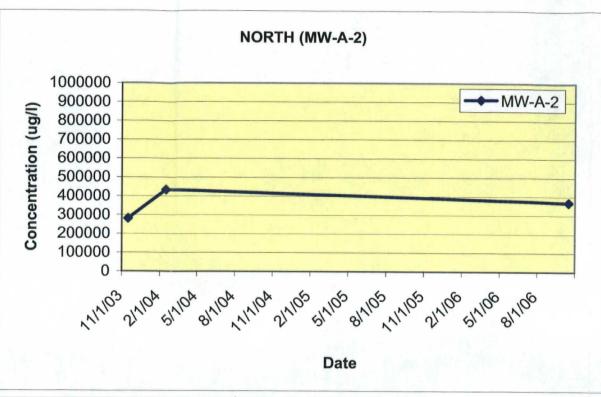
	Date	MW-N-1
MW-N-1	11/01/03	19300
	02/01/04	22700
	10/25/2006	29500

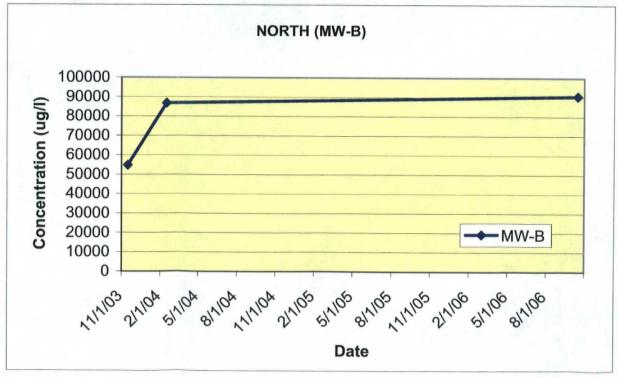




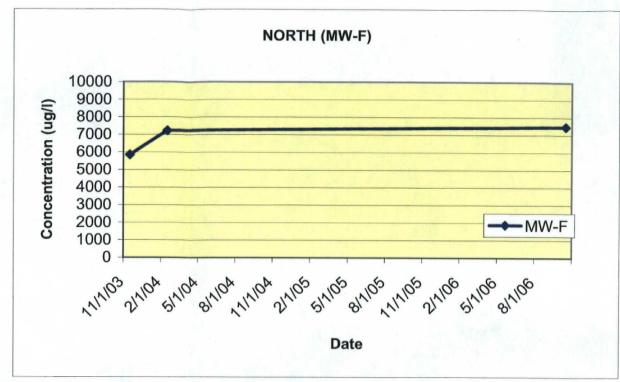
	Date	MW-A-2
MW-A-2	11/01/03	283000
	02/01/04	435000
	10/25/2006	369000

	Date	MW-B
MW-B	11/01/03	54900
	02/01/04	87000
	10/24/2006	90700

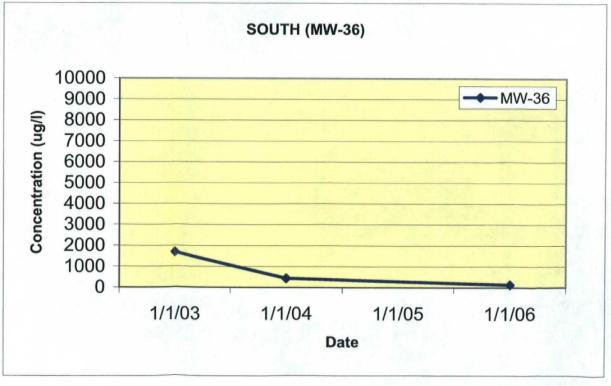




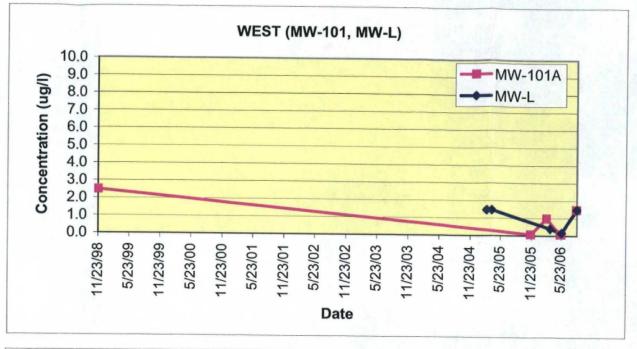
	Date	MW-F
MW-F	11/01/03	5860
	02/01/04	7240
45	10/24/2006	7480



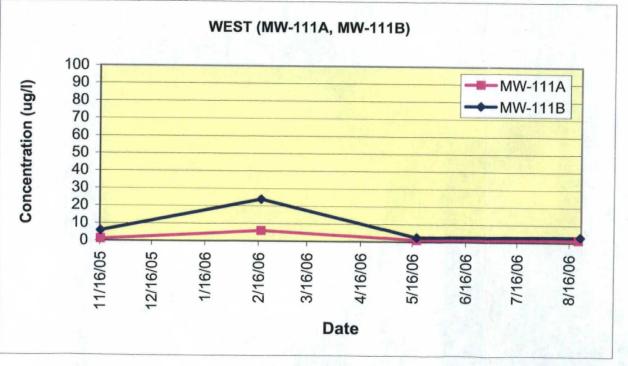
	Date	MW-36	tall lives of the section
MW-36	10/1/2003	1700	
	12/2/2004	455	
	10/26/2006	141	1/2 DL



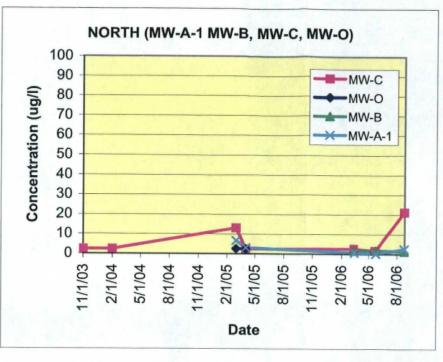
	Date	MW-101A	MW-L	
MW-101A	11/23/1998	2.5		1/2 DL
4	11/17/2005	0.1		1/2 DL
	2/21/2006	1.0		
	5/18/2006	0.1	-7 .77-	1/2 DL
	5/22/2006	0.1		1/2 DL
	8/21/2006	1.5		1/2 DL
1	8/21/2006	1.5		1/2 DL
MW-L	3/1/2005		1.5	1/2 DL
	4/1/2005		1.5	1/2 DL
	3/15/2006		0.42	
	8/24/2006		1.5	1/2 DL
	3/15/2006		0.41	
	5/24/2006		0.18	
	8/24/2006	B/G C	1.5	1/2 DL



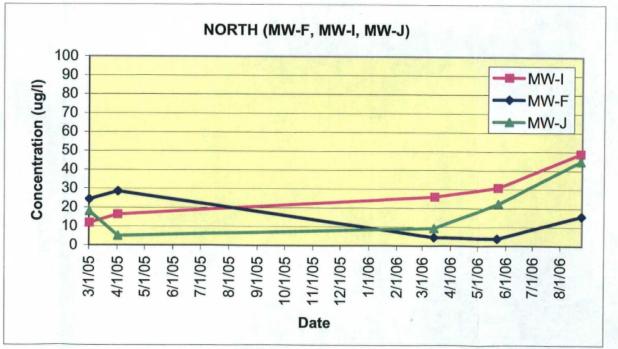
	Date	MW-111A	MW-111B	
MW-111A	11/16/2005	1.3		
-1.57	11/16/2005	1.2		
	2/17/2006	6.1		
	2/17/2006	6.1		
	5/18/2006	1.1	3.2	Thirty.
	8/21/2006	1.5		1/2 DL
MW-111B	11/16/2005		5.9	
	2/17/2006		24	
	5/18/2006		2.6	
1 A	8/22/2006		3.25	1/2 DL



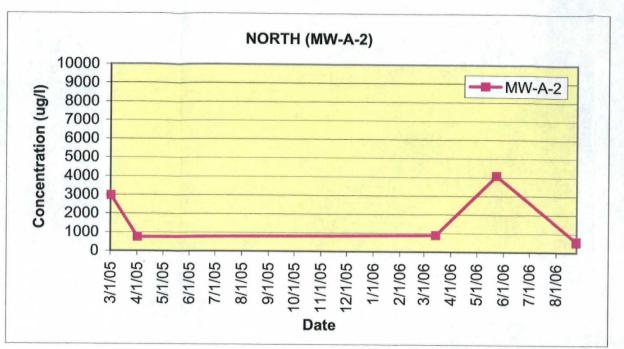
	Date	MW-C	MW-O	MW-B	MW-A-1	
MW-C	3/13/2006	2.7				
	5/22/2006	1.7	1 - 270 11 14	A THE STATE OF		
	8/24/2006	21.3				
	11/1/2003	2.5	grave Tr. 21			1/2 DL
	2/1/2004	2.5				1/2 DL
	3/1/2005	13.3				
	4/1/2005	2.5	AC THE			1/2 DL
MW-O	03/01/05	AND PROPERTY.	2.78			
	04/01/05		2.5			1/2 DL
MW-B	3/13/2006			1.8		
	5/23/2006			1.9		
	8/24/2006			1.5		1/2 DL
MW-A-1	03/01/05				6.9	
	04/01/05		1 - 78 × 11.6		3.23	
	3/14/2006				0.82	
	5/23/2006				0.23	1/2 DL
	8/23/2006	- F 15 M			2.75	1/2 DL



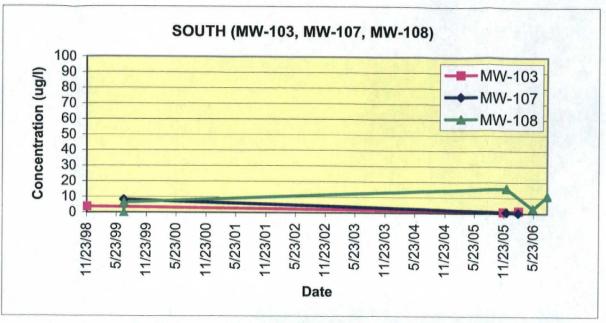
	Date	MW-I	MW-F	MW-J
MW-I	03/01/05	12		
	04/01/05	16.5	The state of the s	of F. A.L.
	3/14/2006	26	175 6 1	
	5/23/2006	30.9		
	8/23/2006	48.9		10-1-1
MW-F	03/01/05		24.5	
	04/01/05		28.8	
	3/13/2006		4.6	
	5/22/2006		3.9	
	8/24/2006		15.8	
MW-J	03/01/05	E 188	- 12 13	18.1
	04/01/05	15		5.25
	3/13/2006			9.4
	5/23/2006			22.4
	8/23/2006			45



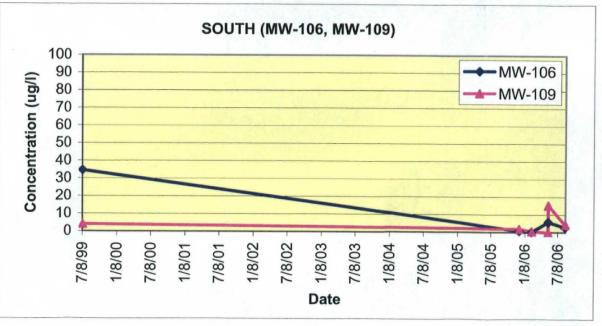
	Date	MW-A-2
MW-A-2	03/01/05	2990
	04/01/05	757
	8/24/2006	590
	3/14/2006	900
	5/23/2006	4100
	8/24/2006	536



	Date	MW-103	MW-107	MW-108
MW-103	11/23/1998	4	3	
	11/18/2005	1		
	2/20/2006	1.7		
MW-107	7/8/1999		8.4	
	12/6/2005		0.9	
	2/16/2006		0.39	Mena Son Yo
MW-108	7/9/1999	KATE STOR		6.7
	12/7/2005			16.2
	5/17/2006			3.2
	8/18/2006			11.3



1	Date	MW-106	MW-109
MW-106	7/8/1999	34.8	
	12/6/2005	0.9	
	2/13/2006	0.32	
	5/16/2006	5.9	
	8/15/2006	3	N. L. G. C. Committee
MW-109	7/9/1999		4.2
	12/6/2005		2.1
	2/15/2006	W ₁	0.72
	5/17/2006		15.3
	8/17/2006		4.3



	Date	MW-29	MW-31	
MW-29	6/11/2003	2.5		1/2 DL
	10/1/2003	8.6		
	12/3/2004	32	The second	
	8/16/2006	1.5		1/2 DL
MW-31	10/1/2003		5.2	1/2 DL
	11/29/2004		24	
	8/16/2006		1.5	THE RESERVE

